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Section 7

Implementation Strategies

This section builds on the priority issues identified in Section 6 and proposes strategies to address the major water quality problems in the Coosa River basin.

Georgia's Mission Statement for river basin management planning is "to develop and implement a river basin planning program to protect, enhance, and restore the waters of the state of Georgia that will provide for effective monitoring, allocation, use, regulation, and management of water resources". Associated with this mission are a variety of goals which emphasize coordinated planning necessary to meet all applicable local, state, and federal laws, rules, and regulations, and provide for water quality, habitat, and recreation. For the Coosa basin, these goals will be implemented through a combination of a variety of general strategies, which apply across the basin and across the state, and targeted or site-specific strategies. Section 7.1 describes the big-picture management goals for the Coosa River basin. Section 7.2 describes the general and basinwide implementation strategies most relevant to the Coosa River Basin Management Plan. Targeted strategies for specific priority concerns within each subbasin, as identified in Section 6, are then presented in Section 7.3.

7.1 "Big Picture" Overview for the Coosa River Basin

This Coosa River Basin Management Plan includes strategies to address a number of different basinwide objectives. These include:

- Protecting water quality in lakes, rivers and streams through attainment of water quality standards and support for designated uses;
- Providing adequate, high quality water supply for municipal, agricultural, industrial, and other human activities;
- Preserving habitat suitable for the support of healthy aquatic and riparian ecosystems;
- Protecting human health and welfare through prevention of water-borne disease; minimization of risk from contaminated fish tissue, and reduction of risks from flooding; and

- Ensuring opportunities for economic growth, development, and recreation in the region.

Achieving these objectives is the responsibility of a variety of state and federal agencies, local governments, business, industry, and individual citizens. Coordination between partners is difficult, and impacts of actions in one locale by one partner on conditions elsewhere in the basin are not always understood or considered. River Basin Management Planning (RBMP) is an attempt to bring together stakeholders in the basin to increase coordination and to provide a mechanism for communication and consideration of actions on a broad scale to support water resource objectives for the entire basin. RBMP provides the framework to begin to understand the consequences of local decisions on basinwide water resources.

RBMP, begun in 1993, is changing the way EPD and other state agencies do business. At the same time, local government comprehensive planning requirements require a higher degree of effort and awareness by local governments to address resource protection and planning for the future.

This plan presents general broad-scale goals and strategies for addressing the most significant existing and future water quality and quantity issues within the Coosa basin. The basin plan provides a whole-basin framework for appropriate local initiatives and controls, but cannot specify all the individual local efforts which will be required. The basin plan will, however, provide a context and general management goals for the local-scale plans needed to address local-scale nonpoint loads in detail. EPD expects local governments and agencies to take the initiative to develop local strategies consistent with the basin-scale strategies presented in this plan.

A number of concerns identified in this plan will affect planning and decision-making by local governments, state agencies, and business interests. Detailed strategies for addressing identified concerns are presented in Section 7.4. This section provides an overview of the key "big picture" issues and planning opportunities in the Coosa River basin.

7.1.1 Water Quality Overview

As discussed in Section 5, water quality in the Coosa River basin is generally good at this time, although problems remain to be addressed and proactive planning is needed to protect water quality into the future. Many actions have already been taken to protect water quality. Programs implemented by federal, state, and local governments, farmers, foresters, and other individuals have greatly helped to protect and improve water quality in the basin over the past twenty years. Streams are no longer dominated by untreated or partially treated sewage or industrial discharges, which resulted in little oxygen and impaired aquatic life. For the most part, local government and industrial wastewaters are properly treated, oxygen levels have returned, and fish have followed.

The primary source of pollution that continues to affect waters of the Coosa River basin results from nonpoint sources. Key types of nonpoint source pollution impairing or threatening water quality in the Coosa River basin include erosion and sedimentation, bacteria from urban and rural nonpoint sources, metals from urban and rural sources, excess nutrient loads to reservoirs, and increases in water temperature resulting from loss of riparian canopy and increased paved surface areas. These problems result from the cumulative effect of activities of many individual landowners or managers. Population is growing every year, increasing the potential risks from nonpoint source pollution. Growth is essential to the economic health of the Coosa River basin, yet growth without proper land use planning and implementation of best management practices to protect streams and rivers can create harmful impacts on the environment.

Because there are so many small sources of nonpoint loading spread throughout the watershed, nonpoint sources of pollution cannot effectively be controlled by state agency permitting and enforcement, even where regulatory authority exists. Rather, control of nonpoint loading will require the cooperative efforts of many partners, including state and federal agencies, individual landowners, agricultural and forestry interests, local county and municipal governments, and Regional Development Centers. A combination of regulatory and voluntary land management practices will be necessary to maintain and improve the water quality of rivers, streams, and lakes in the Coosa River basin.

Key Actions by EPD

The Georgia EPD Water Protection Branch has responsibility for establishing water quality standards, monitoring water quality, river basin planning, water quality modeling, permitting and enforcement of point source NPDES permits, and developing Total Maximum Daily Loads (TMDLs) where ongoing actions are not sufficient to achieve water quality standards. Much of this work is regulatory. EPD is also one of several agencies responsible for facilitating, planning, and educating the public about management of nonpoint source pollution. Nonpoint source programs implemented by Georgia and by other states across the nation are voluntary in nature. The Georgia EPD Water Resources Branch regulates the use of Georgia's surface and ground water resources for municipal and agricultural uses, which includes source water assessment and protection activities in compliance with the Safe Drinking Water Act.

Actions being taken by EPD at the state level to address water quality problems in the Coosa River basin include the following:

- **Watershed Assessments and Watershed Protection Implementation Plans**. When local governments propose to expand an existing wastewater facility, or propose a new facility with a design flow greater than 0.5 million gallons per day, EPD requires a comprehensive watershed assessment and development of a watershed protection implementation plan. The watershed assessment includes monitoring and assessment of current water quality and land use in the watershed and evaluation of the impacts of future land use changes. A watershed protection implementation plan includes specific strategies such as land use plans and local actions designed to ensure that existing problems are being addressed and that future development will be conducted in a way to prevent water quality standards violations.
- **Total Maximum Daily Loads (TMDLs)**. Where water quality sampling has documented standards violations and ongoing actions are not sufficient to achieve water quality standards in a two year period, a TMDL will be established for a specific pollutant on the specific stream segment in accordance with EPA guidance. The TMDL will specify the allowable loading of a pollutant from both point and nonpoint sources. EPD will implement TMDLs through a watershed approach using a combination of regulatory and non-regulatory tools.
- **Source Water Protection**. Most of the public water supply in the Coosa basin is drawn from surface water. To provide for the protection of public water supplies, Georgia EPD is developing a Source Water Assessment Program in alignment with the 1996 amendments to the Safe Drinking Water Act and corresponding recent EPA initiatives. This new initiative is expected to result in assessments of threats to drinking water supplies and, ultimately, local Source Water Protection Plans. Recent "Criteria for Watershed Protection" (a sub-section of the Rules for Environmental Planning Criteria) produced by the Department of Community Affairs set minimum guidelines for protection of watersheds above "governmentally owned" water supply intakes.

- **Lake Water Quality Standards**. The Coosa River basin contains three major reservoirs: Lake Allatoona and Carters Lake in Georgia, and Lake Weiss in Alabama. Georgia has adopted site-specific standards for three lakes in other basins in accordance with state law which requires comprehensive assessments and standards be established for major, publicly owned lakes in Georgia. Comprehensive studies of Lakes Allatoona, Carters, and Weiss are ongoing based on EPA Clean Lakes funding. Georgia will initiate the standards setting process for Lakes Allatoona and Carters following completion and approval of the Clean Lakes studies.
- **Fish Consumption Guidelines**. EPD and the Wildlife Resources Division work to protect public human health by testing fish tissue and issuing fish consumption guidelines as needed, indicating the recommended rates of consumption of fish from specific waters. The guidelines are based on conservative assumptions and provide the public with factual information for use in making rational decisions regarding fish consumption.

Key Actions by Resource Management Agencies

Nonpoint source pollution from agriculture and forestry activities in Georgia is managed and controlled with a statewide non-regulatory approach. This approach is based on cooperative partnerships with various agencies and a variety of programs.

Agriculture in the Coosa River basin is a mixture of livestock and poultry operations and commodity production. About 15 percent of the basin land area is in agricultural use. Key partners for controlling agricultural nonpoint source pollution are the Soil and Water Conservation Districts, Georgia Soil and Water Conservation Commission, and the USDA Natural Resources Conservation Service. These partners promote the use of environmentally-sound Best Management Practices (BMPs) through education, demonstration projects, and financial assistance. In addition to incentive payments and cost-sharing for BMPs, three major conservation programs from USDA will be available to producers and rural landowners. These are the Conservation Reserve Program, which protects highly erodible and environmentally sensitive land, the Wetland Reserve Program, designed to protect, restore, and enhance wetlands with cost-share incentives, and the Wildlife Habitat Incentives Program, which will help landowners develop and improve wildlife habitat.

Forestry is a major part of the economy in the Coosa basin and forest lands represent over 75 percent of the total basin land area. The Georgia Forestry Commission (GFC) is the lead agency for controlling silvicultural nonpoint source pollution. The GFC develops forestry practice guidelines, encourages BMP implementation, conducts education, investigates and mediates complaints involving forestry operations, and conducts BMP compliance surveys. Recently, the State Board of Registration for Foresters adopted procedures to sanction or revoke the licenses of foresters involved in unresolved complaints where the lack of BMP implementation has resulted in water quality violations.

Additional requirements are imposed within the extensive National Forest areas of the Coosa basin. Each National Forest produces and regularly updates a Land and Resource Management Plan to guide timber harvesting and other activities. These plans establish long range goals and objectives, specific management practices and the vicinity in which they will occur, standards and guidelines on how management practices will be applied, and monitoring procedures to assure the Plan is followed.

Key Actions by Local Governments

Addressing water quality problems resulting from nonpoint source pollution will primarily depend on actions taken at the local level. Particularly for nonpoint sources associated with urban and residential development, it is only at the local level that regulatory authority exists for zoning and land use planning, control of erosion and sedimentation from construction activities, and regulation of septic systems.

Local governments are increasingly focusing on water resource issues. In many cases, the existence of high quality water has not been recognized and managed as an economic resource by local governments. That situation is now changing due to a variety of factors, including increased public awareness, high levels of population growth in many areas resulting in a need for comprehensive planning, recognition that high quality water supplies are limited, and new state-level actions and requirements. The latter include:

- Requirements for Watershed Assessments and Watershed Protection Implementation Plans when permits for expanded or new municipal wastewater discharges are requested;
- Development of Source Water Protection Plans to protect public drinking water supplies;
- Requirements for local comprehensive planning, including protection of natural and water resources, as promulgated by the Georgia Department of Community Affairs.

In sum, it is the responsibility of local governments to implement planning for future development which takes into account management and protection of the water quality of rivers, streams, and lakes within their jurisdiction. One of the most important actions that local governments should take to ensure recognition of local needs while protecting water resources is to participate in the basin planning process, either directly or through Regional Development Centers.

7.1.2 Water Quantity Overview

In addition to protecting water quality, it is essential to plan for water supply in the Coosa River basin. The Georgia EPD Water Resources Branch regulates the use of Georgia's surface and ground water resources for municipal and agricultural uses, and is responsible for ensuring sufficient instream flows are available during a critical drought condition to meet permitted withdrawal requirements without significant impact to the environment. The withdrawal permit process must not overuse the available resources. The Water Resources Branch is also responsible for regulation of public water systems for compliance with the Safe Drinking Water Act, and regulation of dams for compliance with the Safe Dams Act.

At this time, water quantity appears to be adequate for all uses within the Georgia portion of the basin (Section 5.1), and there are no major new water supply projects proposed. There are, however, several water quantity concerns in the Coosa basin which are of significance to decision makers.

One of the major water quantity concerns in the Coosa River basin is the fairly rapid growth being experienced in the counties near Lake Allatoona (i.e., Cherokee, Bartow, Forsyth and Cobb), and the corresponding additional water needs. This growth is expected to accelerate somewhat as the metropolitan Atlanta region begins to have more of a synergistic effect on each other. Since Cobb County is divided between the Coosa and Chattahoochee River basins, many parts of south Cobb receive water from the Coosa basin. As Marietta grows it will take more water from Lake Allatoona thus increasing transfer of water out of the Coosa basin.

In the Dalton–Whitfield area of the basin, the carpet textile industry is forecasted to grow and to demand additional water resources.

Water resources within the political boundaries of individual counties in the region may not be sufficient to meet longer-term "in-county" needs; therefore, regional cooperation to develop water supply options will become ever more important to support growth in the region. Interbasin diversion of water to meet the growing needs in the region is another option that will likely get more attention.

Interbasin diversions are not prohibited within Georgia, however the Rules for Water Quality Control do require EPD to proceed in the following manner before making decisions regarding such transfers:

1. Give due consideration to existing competing uses that might be impacted by such transfers;
2. Issue a press release which describes the proposed transfer; and
3. If the public interest which is expressed in reaction to the press release is sufficient to warrant a public hearing, EPD will hold a hearing to receive comments on the proposed transfer prior to making a final decision.

ACT/ACF Allocations

Water quantity within the Coosa basin is also subject to interstate agreements. In 1990 the State of Alabama, concerned about the availability of water for its future needs, filed suit in U.S. District Court to prevent the Corps of Engineers from reallocating water from Lakes Lanier, Carters, and Allatoona to increase the water supply for metropolitan Atlanta; Florida later joined this suit. Under a letter of agreement signed by the three states and the Corps, the ACT/ACF (Alabama- Coosa-Tallapoosa/ Apalachicola-Chattahoochee-Flint) Comprehensive Study was initiated in 1991. In 1997 the three state legislatures approved separate Interstate Compacts which establish the legal and functional basis for future management of the ACT and ACF basins. The President signed the compacts on November 20, 1997.

The compacts require that water allocations be developed before the end of 1998. Obviously the allocation for the ACT Basin will have a potentially significant effect on water resource planning in the Coosa basin in Georgia. It is expected that the allocation will establish some form of operation for Lake Allatoona and Carters, including a commitment for Georgia to allow certain quantities of water to pass downstream for use by Alabama. Such a commitment will not establish how the water may be used within Georgia; those decisions will remain the prerogative of Georgia's governments and citizens. However, it is possible that there may be limitations on quantities of water which will be available for various uses in the Coosa basin.

Sources of water supply to meet the long-term needs of the Dalton area have not been decided at this time. Further allocations by the COE of water supply storage within both Carters Lake and Lake Allatoona are uncertain until the ACT/ACF Comprehensive Study is completed and reallocation formulas are agreed upon. Because of the high proportion of industrial uses in the Coosa basin, this constraint causes local governments within the Coosa basin to be concerned about losing the stability and possible growth associated with their cooperation with industry.

In cases where there is competition for water across water use categories (i.e., water held in lakes for recreation vs. withdrawal for potable uses), Georgia law requires that priority be given to water for human consumption. However, it is far more likely that the competition will not be across water use categories as much as there will be competition for scarce water between adjoining jurisdictions. In such instances, EPD presently does (and will continue to) encourage cooperative efforts to develop and effectively utilize

limited water resources. While cooperative intergovernmental approaches are much preferred in addressing such competition, the fact that the Director of EPD has the statutory authority to make final decisions regarding water withdrawal applications means that EPD will assist in resolving such matters if other efforts fail.

7.2 General Basinwide Management Strategies

There are many statewide programs and strategies that play an important role in the maintenance and protection of water quality in the Coosa basin. These general strategies are applicable throughout the basin to address both point and nonpoint source controls.

7.2.1 General Surface Water Protection Strategies

Antidegradation

The State of Georgia considers all waters of the state as high quality and applies a stringent level of protection for each waterbody. Georgia Rules and Regulations for Water Quality Control, Chapter 391-3-6-03(2)(b) contains specific antidegradation provisions as follows:

> (b) Those waters in the State whose existing quality is better than the minimum levels established in standards on the date standards become effective will be maintained at high quality; with the State having the power to authorize new developments, when it has been affirmatively demonstrated to the State that a change is justifiable to provide necessary social or economic development and provided further that the level of treatment required is the highest and best practicable under existing technology to protect existing beneficial water uses. Existing instream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected. All requirements in the Federal Regulations, 40 C.F.R. 131.12, will be achieved before lowering of water quality is allowed for high quality water.

The antidegradation review process is triggered at such time as a new or expanded point source discharge is proposed that may have some effect on surface water quality. Such proposals are reviewed to determine if the new discharge is justifiable to provide necessary social or economic development and that the level of treatment required is the highest and best practicable under existing technology to protect existing beneficial water uses.

Applicants for new or expanded point source discharges into any surface water must perform an alternative analysis comparing the proposed discharge alternative to a "no-discharge" land application or urban reuse alternative. The application for discharge to surface waters will only be considered if the less degrading alternatives are determined to be economically or technically infeasible. In all cases, existing instream water uses and the level of water quality necessary to protect the existing use shall be maintained and protected.

Water Supply Watershed Protection Strategy

As population continues to increase within the Coosa River basin, it will become ever more important to protect the water quality of already developed raw water sources. EPD is acting in concert with the Department of Community Affairs to produce a set of "guidelines" which define, among other things, measures that local governments are encouraged to take to protect drinking water sources. The "guidelines" are entitled Rules for Environmental Planning Criteria, and establish environmental protection criteria for five environmental categories: water supply watersheds, groundwater recharge areas,

mountains, river corridors and wetlands. The *Criteria for Watershed Protection* (a sub-section of the Rules for Environmental Planning Criteria) set minimum guidelines for protection of watersheds above "governmentally owned" water supply intakes. The degree of protection depends upon the size of the watershed; watersheds with drainage areas of less than 100 square miles are subject to more strict criteria as summarized below:

- Impervious surface densities limited to 25 percent over the entire watershed.
- Buffer/setback requirements equal to 100/150 feet within seven (7) mile radius of the intake and 50/75 feet outside the seven (7) mile radius; and
- A reservoir management plan (including 150 foot buffer around the perimeter of the reservoir).

Watersheds with drainage areas of 100 square miles or more are subject to less strict criteria as summarized below:

- An intake on a flowing stream (as opposed to being located within a reservoir) shall have no specified minimum criteria; and
- An intake with a water supply reservoir shall have a minimum of 100 feet natural buffer within a seven mile radius of the reservoir, and no impervious cover constructed within a 150 foot setback area on both banks of the stream.

EPD is also actively working toward meeting the national goal that, by the year 2005, 60 percent of the population served by community water systems will receive their water from systems with source water protection programs (SWPP) in place under both wellhead protection and watershed protection programs. EPD intends to accomplish this goal by developing and implementing a source water assessment program (SWAP) in alignment with EPA's initiatives.

Although the procedures and strategies of the new program are incomplete to date, the Drinking Water Program (DWP) will compile a statewide source water assessment plan soliciting input from the public and approval from EPA. The plan will specify how the state will delineate areas providing source waters for public water systems, identify origins of contaminants in delineated areas, determine the susceptibility of public water sources to the contaminants and provide the basis for local individual source water protection plans for each different public water system. Once the statewide plan is approved the DWP will be allowed the flexibility to help complete the local source water protection plans for contracted public water systems and provide financial and technical assistance to help develop long range source water protection strategies for the public water system. The Source Water Assessment program will build upon EPD's other assessment and prevention programs, including the Well Head Protection Program, the Vulnerability Assessment and Waiver Program and the River Basin Management Plans, by soliciting active public participation from the local communities and assist in the preparation of the local water system's protection plan.

Total Maximum Daily Loads

Section 303(d) of the Clean Water Act (CWA) establishes the TMDL, or total maximum daily load, process as a tool to implement water quality standards. Georgia is required by the CWA to identify and list waterbodies where water quality standards are not met following the application of technology based controls, and to establish TMDLs for the listed stream segments. The USEPA is required to approve or disapprove Georgia's 303(d) list of waters and TMDLs.

The most recent requirement for 303(d) list submittal occurred in 1998. Georgia submitted a draft 303(d) list to the EPA in February 1998. The EPA reviewed the

Georgia submittal and provided comments in March 1998. Georgia submitted a final 303(d) listing to the EPA on April 1, 1998.

Georgia's 1998 303(d) listing is based on the Georgia 305(b) water quality assessments. The 305(b) assessment is presented in the report *Water Quality in Georgia, 1996-1997*. The 305(b) assessment tables are reprinted in Appendix E of this report. The tables provide a code indicating the 303(d) listing status of assessed segments within the Coosa River basin. An explanation of the codes is given below. An "X" in the 303(d) column indicates the segment is on the Georgia 303(d) list.

1 Segments identified as not supporting or partially supporting designated uses where actions have been taken and compliance with water quality standards achieved. These segments are not part of the Georgia 303(d) list.

2 Segments identified as not supporting or partially supporting designated uses where existing enforceable State, local, or Federal requirements are expected to lead to attainment of water quality standards without additional control strategies. These segments are not part of the Georgia 303(d) list.

3 Segments where TMDLs were completed and approved by EPA in 1998.

X Waters with active 303(d) status. These segments are assessed as not supporting or partially supporting designated uses, and may require additional controls to achieve designated uses. These segments make up the Georgia 303(d) list.

NA Waters assessed as supporting designated uses.

Georgia will address a number of the listed waters in the 1999-2000 time period, however, the majority of work on segments in the Coosa River will be addressed in the second round of basin planning. The second round of basin planning for the Coosa River will begin in 2000 and the river will be the focus of monitoring in the year 2001. Significant efforts will be made to assess the condition of the listed 303(d) waters at that time and results of the assessments will dictate the areas where TMDLs will be developed. TMDLs will be publicly noticed for appropriate segments in June 2003.

7.2.2 Management of Permitted Point Sources

The strategies in this section strive to minimize adverse effects from municipal, industrial, and concentrated discharges. Permitted discharges of treated wastewater are managed via the National Pollutant Discharge Elimination system (NPDES) permit program. The NPDES permit program provides a basis for regulating municipal and industrial discharges, monitoring compliance with effluent limitations, and initiating appropriate enforcement action for violations. EPD has formulated general strategies for a number of types of environmental stressors under the NPDES program.

Analysis of Alternatives

Applicants for new or expanded point source discharges into any surface water must perform an alternative analysis comparing the proposed discharge alternative to a "no discharge", land application or urban reuse alternative. The application for discharge to surface waters will only be considered if the less degrading alternatives are determined to be economically or technically infeasible. In all cases, existing instream water uses and the level of water quality necessary to protect the existing use shall be maintained and protected.

Permit Issuance/Reissuance Strategies

During the basin plan implementation phase, issues identified in the written basin plan pertaining to point source discharges will be assessed. The assessment will include such things as 1) identified point source discharge problem areas, 2) data evaluations, 3) wasteload allocations and/or TMDLs with identified problem point sources, and 4) toxic pollutants identified with point source discharges. Permits associated with identified problems will be evaluated to determine if a reopening of the permit is appropriate to adequately address the problem.

Watershed Assessment Requirements

A watershed assessment is generally initiated when, due to growth and development, a local government sees a need to increase the hydraulic capacity of an existing wastewater treatment facility (or propose a new facility) and contacts the EPD for a NPDES permit modification. If an antidegradation review demonstrates that it is not feasible to handle the additional capacity needs with a land treatment or other no discharge system, the community may pursue an increase in its surface water discharge. The initial step in this process is the completion of a watershed assessment, which is the first step towards assuring that all water quality standards will be maintained throughout a watershed during both critical dry and wet weather conditions in response to both point and nonpoint source loads.

The watershed assessment is actually a study, an assessment, and a plan. It is about collecting data and learning relationships between what is going on in a watershed and how these activities (land uses, etc.) impact water quality, then using this knowledge to develop both short and long term plans designed to ensure the attainment of water quality standards. The assessment should address current conditions and consider projected land use changes. Only when it can be demonstrated that water quality standards are and will continue to be maintained, can the EPD develop a wasteload allocation and prepare a defensible permit for a proposed new wastewater treatment facility or proposed hydraulic expansion of an existing wastewater treatment facility discharging to the watershed. The assessment should include a detailed plan to address both current water quality and biological problems and any predicted future water quality and biological problems. Key components of such a plan will likely be adopted by EPD as “special conditions” of the pertinent new or modified NPDES permit.

Facility Construction/Improvements

EPD has promoted continuing improvement in the quality of return flows from permitted point sources in the basin. Upgrading wastewater treatment facilities is a significant strategy to meet effluent limits from discharges. In the past ten years, various upgrades and improvements have been made to industrial and municipal treatment systems throughout the Coosa River basin. The funding for these projects has come from state and federal construction grants and the citizens of local municipalities. Appendix C provides detailed information on expenditures by city and county governments on upgrading wastewater treatment facilities in the basin.

Domestic Wastewater Systems

The collecting, treating and disposing of wastewater in Georgia is regulated by a number of environmental laws that are administered by various agencies in local and state government. When a local government or private concern (owner) identifies a need for a wastewater treatment and disposal system it is imperative that thorough and adequate planning take place.

Wastewater systems that discharge treated wastewater to a surface stream must be permitted through the federal National Pollution Discharge Elimination System (NPDES) and meet all the requirements of that system. In Georgia, with very few exceptions, surface discharge permits will only be issued to publicly owned systems.

Wastewater systems that do not result in a discharge to surface waters, such as slow rate land treatment systems and urban reuse systems (no discharge), are permitted through the State of Georgia's land application system (LAS) permitting process. Both publicly and privately owned systems can apply for and receive LAS permits.

Chlorine

If a chlorine limit is not already required in an NPDES permit, all major municipal wastewater facilities (i.e., those with design flows greater than or equal to 1.0 million gallons per day [MGD]) are required to meet a chronic toxicity-based chlorine limitation when the permit comes up for routine reissuance. The limitation is calculated based on a maximum instream concentration of 0.011 mg/l, the facility's design flow, and the 7Q10 low flow of the receiving stream. No facilities are given a limitation higher than 0.5 mg/l as this is deemed to be an operationally achievable number even if a facility does not have dechlorination equipment installed. Facilities which are given a limitation more stringent than 0.5 mg/l which do not already have dechlorination equipment installed, are given up to a two year schedule in which to meet the limitation. All discharging facilities which are upgrading are required to meet a chlorine limitation as part of the upgrade, based on the same criteria noted above.

Ammonia

Ammonia in effluents poses a problem both as a source of toxicity to aquatic life and as an oxygen-demanding waste. New facilities and facilities proposed for upgrade are required to meet ammonia limits for toxicity if those limits are more stringent than instream dissolved oxygen based limits. Existing facilities are not be required to meet ammonia limits based on calculated toxicity unless instream toxicity has been identified through toxicity testing.

Metals/Priority Pollutants

Major municipal and industrial facilities are required to submit periodic priority pollutant scans to EPD as part of their permit monitoring requirements or upon submittal of a permit application for permit reissuance. The priority pollutant data is assessed in accordance with the Georgia Rules and Regulations for Water Quality Control. The results of the assessment can be used to trigger either additional priority pollutant monitoring, a toxicity reduction evaluation or permit limits for certain parameters.

Color

The State's narrative water quality standard for color requires that all waters shall be free from material related to discharges which produce color which interferes with legitimate water uses. EPD's color strategy will address this standard for industrial and municipal discharges by implementing permit limits and/or color removal requirements. EPD requires new facilities or discharges to prevent any noticeable color effect on the receiving stream. EPD requires existing facilities with color in their effluent to collect upstream and downstream color samples when their NPDES permit is reissued. The facility must conduct an assessment of the sources of color. Also, a color removal evaluation may be required at permit reissuance. EPD will also target facilities for color removal requirements based on significant citizen complaints of discoloration in streams.

Phosphorus

EPD establishes phosphorus control strategies where needed to address water bodies where water quality is limited by excess phosphorus loading. For instance, allowable phosphorus loading to West Point Lake (Chattahoochee basin) is specified in regulation to prevent undesirable eutrophication of that waterbody. Point source control of phosphorus typically involves stringent limits on phosphorus concentrations in municipal NPDES facility effluents. There are ongoing Clean Lakes Phase I studies for Carters Lake and Lake Allatoona in Georgia and Lake Weiss, which receives inflow from the Georgia portion of the Coosa River. These Clean Lakes studies will assess the need for phosphorus control strategies within some or all of the Coosa River basin.

Temperature

Permits issued for facilities which discharge to primary trout streams are required to have no elevation of natural stream temperatures. Permits issued for facilities which discharge to secondary trout streams are required to not elevate the receiving stream more than 2 degrees Fahrenheit.

Storm Water Permitting

The 1987 Amendments to the federal Clean Water Act require permits to be issued for certain types of discharges, with primary focus on runoff from industrial operations and large urban areas. The EPA promulgated Storm Water Regulations on November 16, 1990. EPD subsequently received delegation from the EPA in January 1991 to issue General Permits and regulate storm water in Georgia. EPD has developed and implemented a strategy which assures compliance with the federal regulations.

The "Phase I" Federal Regulations set specific application submittal requirements for large (population 250,000 or more) and medium (population 100,000 to 250,000) municipal separate storm sewer systems. Accordingly, Georgia has issued individual area-wide NPDES municipal separate storm sewer system (MS4) permits to 58 cities and counties in municipal areas with populations greater than 100,000 persons. These permits authorize the municipalities to discharge storm water from the MS4s which they own or operate, and incorporate detailed storm water management programs. These programs may include such measures as structural and non-structural controls, best management practices, inspections, enforcement and public education efforts. Storm water management ordinances, erosion and sediment control ordinances, development regulations and other local regulations provide the necessary legal authority to implement the storm water management programs. Illicit discharge detection and long-term wet weather sampling plans are also included in the management programs. The permit requires the submission of Annual Reports to EPD, describing the implementation of the storm water management program. Among other things, the Annual Report includes a detailed description of the municipality's implementation of its Storm Water Management Plan.

EPA's Phase I Rule addresses only municipalities with populations greater than 100,000 people and construction sites larger than five acres. EPA is proposing a Phase II Rule for municipalities with populations less than 100,000 people and construction sites smaller than five acres. This rule is not expected to be finalized until at least March, 1999. The Phase II Rule will eventually impact some of the municipalities within the basin.

EPD has issued one general permit regulating storm water discharges for 10 of 11 federally regulated industrial subcategories defined in the Phase I Federal regulations. The eleventh subcategory, construction activities, will be covered under a separate

general permit, which is not yet finalized. The general permit for industrial activities requires the submission a Notice of Intent (NOI) for coverage under the general permit, the preparation and implementation of a storm water pollution prevention plan, and in some cases, the monitoring of storm water discharges from the facility. As with the municipal storm water permits, implementation of site-specific best management practices is the preferred method for controlling storm water runoff.

7.2.3 Nonpoint Source Management

The strategies in this section address sources of environmental stressors which are not subject to NPDES permitting and typically originate from diffuse or nonpoint sources associated with land uses. Most strategies that address nonpoint source concerns are not regulatory in nature, but involve a variety of approaches such as technical assistance and education to prevent and reduce nonpoint source pollution in the basin. Strong stakeholder involvement will be essential to effectively implement many of these strategies.

Georgia Nonpoint Source Management Program

The Georgia Environmental Protection Division (EPD) has produced the *Georgia Nonpoint Source Management Program* (PFY98-02), which provides an overview of the State's nonpoint source water quality management activities as well as a summary of what the State intends to accomplish in the next five federal fiscal years. The Georgia Nonpoint Source Management Plan addresses the following categories of nonpoint source pollution loading: Agriculture (crops, pasture, animal operations, aquaculture), Silviculture, Construction, Urban Runoff, Resource Extraction/Exploration/ Development, Land Disposal (Runoff/Leachate from Permitted Areas), Hydrologic/Habitat Modification, and Other.

Agricultural Nonpoint Source Control Strategies

Agricultural nonpoint source pollution continues to be managed and controlled with a statewide non-regulatory approach. This approach uses cooperative partnerships with various agencies and a variety of programs. A brief description of these agencies and outline of their functions and programs is provided below.

Soil and Water Conservation Districts (SWCDs)

Georgia's SWCDs were formed by Act No. 339 of the Georgia General Assembly on March 26, 1937. Their role is to provide leadership in the protection, conservation, and improvement of Georgia's soil, water, and related resources. This is accomplished through promotion efforts related to the voluntary adoption of agricultural best management practices (BMPs).

Currently there are forty active SWCDs in Georgia, four of which contain area within the Coosa River basin: Cobb County Soil and Water Conservation District, Coosa River Soil and Water Conservation District, Limestone Valley Soil and Water Conservation District, and Upper Chattahoochee Soil and Water Conservation District.

At the county level, each SWCD receives technical assistance, via an existing Memorandum of Agreement, from the United States Department of Agriculture's Natural Resources Conservation Service to work with landowners on implementing agricultural BMPs. Through these partnerships applying a voluntary approach to conservation 15 million acres have received conservation treatment in Georgia.

Georgia Soil and Water Conservation Commission (GSWCC)

Georgia's SWCDs receive no annual appropriations and are not regulatory or enforcement agencies. Therefore, the GSWCC was also formed in 1937 to support the SWCDs. GSWCC has been designated as the administering or lead agency for agricultural nonpoint source (NPS) pollution prevention in the state. The GSWCC develops NPS water quality programs and conducts educational activities to promote conservation and protection of land and water resources devoted to agricultural uses. Primary functions of the GSWCC are to provide guidance and assistance to the Soil and Water Conservation Districts and provide education and oversight for the Georgia Erosion and Sedimentation Act.

There are a number of other agricultural agencies administering programs to address water quality and natural resource management issues. Resource Conservation and Development (RC&D) Councils are organized groups of local citizens–supported by USDA–involved in a program to encourage economic development, as well as the wise conservation of natural and human resources. The University of Georgia College of Agricultural and Environmental Sciences (CAES) conducts an education and outreach campaign that encourages producers to increase productivity using environmentally sound techniques. This is accomplished through a number of programs like Farm*A*Syst, Well Water Testing, Nutrient Management, Soil and Water Laboratory Analysis, and informational material on a wide range of subjects. Georgia's Department of Agriculture (GDA) administers a wide variety of insect and plant disease control programs to help regulate the use of pesticides. GDA also inspects irrigation system requirements, such as check valves and back flow prevention devices, for protection of groundwater. The Agricultural Research Service (ARS) conducts research designed to improve the effectiveness of agricultural conservation techniques and promote sustainability. The Natural Resources Conservation Service (NRCS), along with the Farm Services Agency (FSA) and through local Soil and Water Conservation Districts, administers Farm Bill Programs that provide technical and financial incentives to producers to implement agricultural BMPs. The Agricultural Water Use Coordinating Committee, through it's individual members regularly applies for, and receives, funds under section 319(h) of the Clean Water Act to best management practices and demonstration projects throughout the state. The Georgia Soil and Water Conservation Commission has provided state leadership with many of these efforts.

Collectively, these programs will serve to address resource concerns related to agricultural land uses in a coordinated fashion over the next five years until the second iteration of the River Basin Management Planning Cycle. Much of the information regarding opportunities to participate under this voluntary approach to complying with water quality standards is disseminated through commodity commissions and organizations such as the Farm Bureau Federation, Agribusiness Council, Cattlemen's Association, Milk Producers Association, Pork Producers Association, Poultry Federation, and other agricultural support industries.

Prioritization Activities under the Farm Bill

The 1996 Farm Bill provides a number of programs, and processes, designed to address those environmental stressors related to nonpoint sources from Agriculture which were identified in section 4.1.2. A new flagship conservation program, the Environmental Quality Incentives Program (EQIP), will provide the lion's share of funding for technical, educational, and financial assistance. The USDA Natural Resources Conservation Service (NRCS) has leadership for EQIP and works with the USDA Farm Service Agency (FSA) to set policies, priorities, and guidelines. These two

agencies take recommendations from local work groups and a State Technical Committee, comprised of resource professionals from a variety of disciplines, when addressing actual, and potential, resource impairments associated with agricultural land uses.

EQIP provides incentive payments and cost-sharing for conservation practices through 5 to10 year contracts. Producers may receive federal cost-sharing up to 75 percent of the average cost of certain conservation practices such as terraces, grassed waterways, filter strips, buffer strips, manure management facilities, animal waste utilization, and 46 other conservation practices important to improving and maintaining the health of natural resources in an area. An individual producer can receive as much a $50,000 in EQIP funds to implement needed conservation practices.

A majority of funds allocated to Georgia (65 percent) will be spent in priority areas where there are serious and critical environmental needs and concerns. High priority is given to areas where state and local governments offer financial and technical assistance, and where agricultural improvements will help meet water quality and other environmental objectives. During the 1998 federal fiscal year, Georgia has 18 priority areas, two of which are located in the Coosa River basin.

The remaining 35 percent of funds allocated to Georgia can be extended outside priority areas to other parts of the state. Eligibility is limited to persons who are engaged in agricultural productions. Eligible land includes cropland, pastureland, forestland, and other farm lands.

In addition to EQIP there are three major conservation programs from USDA that will be available to producers, and rural landowners. The first is the Conservation Reserve Program (CRP), which protects highly erodible and environmentally sensitive land with grass, trees, and other long-term cover. The Wetland Reserve Program (WRP) is a voluntary program designed to protect, restore, and enhance wetlands with cost-share incentives. Also, the Wildlife Habitat Incentives Program (WHIP) will help landowners develop and improve habitats for upland wildlife, wetland wildlife, endangered species, fisheries, and other wildlife.

Forestry Nonpoint Source Control Strategies

In 1977, the Governor's Silviculture Task Force prepared a report which recommended a voluntary approach to the implementation of best management practices (BMPs) and the designation of the Georgia Forestry Commission (GFC) as the lead agency for implementing the Silviculture portion of the State Section 208 Water Quality Management Plan. The GFC was designated as the lead agency for silvicultural nonpoint source pollution prevention in the state in November, 1979. The Forestry Nonpoint Source Control Program is managed and implemented by the GFC, with the support of the forest industry, for the voluntary implementation of best management practices.

The Forestry Nonpoint Source Control Program is managed by a Statewide Coordinator and appointed foresters serving as District Coordinators from each of the 12 GFC districts. The Statewide and District Coordinators conduct educational workshops, training programs and field demonstrations for the forest community (i.e., landowners, land management and procurement foresters, consulting foresters, timber buyers, loggers, site preparation contractors). The GFC investigates and mediates complaints involving forestry operations. In addition, the GFC conducts BMP compliance surveys to assess the effectiveness of BMP in the forest community. The GFC has established procedures for installing water control structures in firebreaks to reduce soil erosion and sedimentation.

Recently, the State Board of Registration for Foresters adopted procedures to sanction or revoke the licenses of professional foresters involved in unresolved complaints where

the lack of BMP implementation has resulted in state water quality or federal wetlands requirement violations.

Additional requirements are imposed within the National Forest areas of Georgia. Each National Forest produces and regularly updates and Land and Resource Management Plan to guide timber harvest and other activities. These plans establish long range goals and objectives; specific management prescriptions and the vicinity in which they will occur; standards and guidelines on how management prescriptions will be applied; and monitoring procedures to assure the Plan is followed.

Urban Nonpoint Source Control Strategies

The 1990 report of the Community Stream Management Task Force, *We All Live Downstream*, established a road map for urban nonpoint source management in Georgia. The Task Force recognized two major impediments to effectively managing the quality of urban water bodies. The first is the division between 1) statutory responsibilities for management of water quality, granted to EPD, and 2) local government's Constitutional responsibility for management of the land activities which affect urban water bodies. The second impediment is the widespread nature of the nonpoint sources and the variety of activities which may contribute to impacts from urban runoff. They concluded that management of urban nonpoint source pollution would require ". . . a cooperative partnership between layers of government, the private sector, and the general public. The development of such a partnership will require a strong impetus to accept new institutional roles and make the structural changes necessary to support and sustain the stream management process."

EPD has a primary role in facilitating the management of urban runoff, and is responsible for administering and enforcing a variety of permit programs, including permitting of discharges. In addition to these regulatory activities, EPD seeks to assist in development of local solutions to water quality problems; provides technical information on the water resources of the state; and administers grant programs, with funds from various sources to support non-point source planning and assessment, implementation of BMPs, and regional or local watershed management initiatives. EPD also conducts a variety of outreach and educational activities addressing urban runoff in general, regulatory requirements, and cooperative or non-regulatory approaches.

For urban runoff, activities of the Nonpoint Source Management Program interact strongly with point source controls for combined sewers and storm sewers, both of which discharge urban runoff through point conveyances. While the state continues to have an important regulatory role, aspects of the cooperative intergovernmental partnerships envisioned by the Task Force have emerged and are being strengthened. EPD is implementing programs which go beyond traditional regulation, providing the regulated community with greater flexibility and responsibility for determining management practices. Current activities for urban surface runoff control include the following:

- Implement local nonpoint source (NPS) management programs, streambank and stream restoration activities, and community Adopt-A-Stream programs.
- Develop and disseminate local watershed planning and management procedures.
- Implement state and local Erosion and Sedimentation Control Programs.
- Prepare and disseminate technical information on best management practices and nonpoint source monitoring and assessment.
- Implement NPS education programs for grades K through 12 through Project WET (Water Education for Teachers), as described below in Section 7.3.6.

- Implement the Georgia Adopt-A-Stream Program, as described below in Section 7.3.6.
- Identify and evaluate resources to support urban watershed planning and management.

7.2.4 Floodplain Management

Floodplain Management Strategies

Floodplain Management in the State of Georgia is administered under federal regulations and local ordinances. The federal statues are found in Title 44 of the Code of Federal Regulations Parts 59-79. As a condition of participation in the National Flood Insurance Program (NFIP), local political jurisdictions voluntarily adopt Flood Damage Prevention Ordinances, which are based on federal regulations, to enforce and administer floodplain development. Georgia's Floodplain Management Office does not issue permits for floodplain development.

Georgia's Floodplain Management Office, located within the Department of Natural Resources, Environmental Protection Division, serves as liaison between the Federal Emergency Management Agency (FEMA) and local communities participating in the NFIP. However, Georgia's Floodplain Management Office has no regulatory authority. Participation by the local communities in the NFIP is a requirement for the Federal Government to make flood insurance available to all property owners. Through workshops, newsletters, technical assistance and community visits, the Floodplain Management Office assists local governments to maintain compliance with NFIP requirements. The Floodplain Management Office also provides technical data, floodplain maps, and training workshops to various public and private entities involved in floodplain management and floodplain determinations. In addition, the Floodplain Management Office reviews all state-funded and federal-funded projects for development in designated Special Flood Hazard Areas. A major thrust of the Floodplain Management Office is to increase the number of political jurisdictions participating in the NFIP, thereby increasing the number of flood insured structures in Georgia.

River Care 2000 Program

Georgia also has strategies to protect and manage riparian floodplain areas. Of particular relevance is River Care 2000, a conservation program which Governor Miller established in September 1995. One key objective of this program is acquisition of river-corridor lands for purposes of protection and to forestall unwise development in flood-prone areas. The Coordinating Committee has approved procedures for three types of projects: Riverway Demonstration Projects, which improve public access to a river with scenic and recreation uses, and protects natural and historic resources by acquiring and managing land in the river corridor; Significant Sites, which are tracts of land which DNR will acquire and operate as a traditional state public-use facility: wildlife management or public fishing area, park or historic site, natural area, or greenway; and Restoration Sites, which are tracts of land which the state will identify, acquire, and manage to reduce nonpoint-source water pollution.

The River Care 2000 program is also charged with assessing important river resources throughout the state and identifying more effective management tools for river corridors. The program recently released a state-wide assessment of resources associated with rivers throughout the state (GA DNR, 1998).

7.2.5 Wetland Management Strategies

The loss of wetlands, because of the associated adverse impacts to flood control, water quality, aquatic wildlife habitat, rare and endangered species habitat, aesthetics, and recreational benefits, has become an issue of increasing concern to the general public as they become better informed of the values and functions of wetlands. We still suffer from the lack of accurate assessments for current and historic wetland acreage, but, regardless of the method used to measure total acreage or wetland losses, Georgia still retains the highest percentage of precolonial wetland acreage of any southeastern state.

Efforts to Track No Net Loss of Wetlands

While the 1993 Federal Administration Wetlands Plan calls for a concerted effort by EPA and other federal agencies to work cooperatively toward achieving a no overall net loss of wetlands in the short term and a net increase in the quantity of the nation's wetlands in the long run, there have been no statutory or executive level directives to carry out this policy. Achievement of the goal of no net loss is dependent upon limited changes to regulations, memoranda of understanding, cooperative agreements, and other partnerships between federal, state, and local governments, conservation organizations, and private citizens.

All dredge and fill activities in freshwater wetlands are regulated in Georgia by the U.S. Army Corps of Engineers (COE) under Section 404 of the Clean Water Act. The majority of wetland alterations occur under nationwide or general permits, which include permits for bridge building, minor road crossing fills, and fills of less than ten acres above the “headwaters” point of non-tidal streams where the annual average flow is less than 5 cubic feet per second. Enforcement is carried out by the COE and EPA in freshwater wetlands. Normal agricultural and silvicultural operations are exempted under Section 404 regulations.

The COE may require wetland mitigation activities in association were permitting, including creation, restoration, and protection of wetlands. COE may also require wetland restoration in case of violations. In the settlement of violations, restorations occurred on 16.8 acres in 1994, and 17.8 acres in 1995.

Land Acquisition

The Department of Natural Resources (DNR), Wildlife Resources Division (WRD), began a land acquisition program in 1987 to acquire 60,000 acres of additional lands for Wildlife Management Areas (WMAs) and Public Fishing Areas (PFAs). This initiative was funded by $30 million of 20-year obligation bonds to be paid off by hunting and fishing license increases and WMA permit fees.

Beginning in 1990 Governor Zell Miller initiated Preservation 2000, a $60 million program to acquire 100,000 acres of lands to be used for wildlife and fisheries management, parks and recreation, natural area preservation, and general conservation. Additional wetlands acquisition occurs as part of the River Care 2000 initiative, discussed above.

7.2.6 Stakeholder Involvement/Stewardship Strategies

Effective nonpoint source management must address the numerous activities of individuals, businesses, industries, and governments which can adversely affect urban and rural waters. In many cases, these groups are unaware of the potential impacts of their activities or corrective actions which may be taken. Stakeholder involvement and stewardship are essential to address these major challenges.

Georgia has chosen a two-pronged approach to encourage stewardship via education and citizen monitoring. EPD is the lead agency in these education and citizen monitoring programs, but, like other aspects of the state's nonpoint source management effort, cooperative efforts with local governments and community-based groups are critical to their implementation. Outreach and education, including citizen monitoring, lays the groundwork for behavior change and is often an important pre-requisite for effective implementation of BMPs and comprehensive watershed management programs.

General goals for stakeholder involvement and stewardship strategies are:

- Generate local support for nonpoint source management through public involvement and monitoring of streams and other water bodies and of results of management actions.
- Increase individual's awareness of how they contribute to nonpoint source pollution problems and implement appropriate strategies to motivate behavior change and actions to address those problems.
- Provide the educational tools, assistance, and support for addressing NPS problems to target audiences across the state.

Georgia Adopt-A-Stream

The Georgia Adopt-A-Stream Program is designed to promote citizen monitoring and stream protection. Currently, more than 5,000 volunteers participate in individual and community sponsored Adopt-A-Stream Programs. Volunteers conduct clean-ups, stabilize streambanks, monitor streams using biological and chemical methods, and evaluate habitats and watersheds. These activities lead to a greater awareness of water quality and nonpoint source pollution, active cooperation between the public and local governments in protecting water resources, and the collection of basic water quality data. The Georgia Adopt-A-Stream Program focuses on what individuals and communities can do to protect Georgia's water resources from nonpoint source pollution. The Program offers training and support in the following activities – watershed surveys, visual surveys, biological monitoring, chemical testing and clean ups.

The Georgia Adopt-A-Stream Program addresses nonpoint source pollution from agriculture, silviculture, construction and urban runoff. The focus of the Adopt-A-Stream Programs in middle and southern Georgia is often agricultural NPS pollution (especially, where land use is largely agricultural crop production). Examples of agricultural NPS pollution are presented in workshops, videos and manuals (e.g., excess fertilizer and animal waste). In north Georgia, the focus is generally silvicultural NPS pollution (especially, in areas adjacent to the Chattahoochee and Oconee National Forests). Adopt-A-Stream Programs in urban areas address construction and urban runoff NPS pollution. Workshops and training sessions emphasize the connection between land use, runoff and water resources. Erosion and sedimentation control at construction sites is always a major concern with volunteers.

Volunteers are offered three levels of involvement. Each level involves an education and action component on a local stream. Volunteers commit for a minimum of one year on a half-mile stream segment. Level I consists of setting up a project (i.e., identifying a stream segment, identifying partners, registering with the Georgia Adopt-A-Stream Program), evaluating land use and stream conditions during a "watershed walk", conducting quarterly visual evaluations and clean-ups, and one public outreach activity. Volunteers create a "Who to Call for Questions or Problems" list so that if something unusual is noted, immediate professional attention can be obtained. Level II builds on Level I by adding either biological monitoring, chemical monitoring or a habitat improvement project. Level III includes two or more Level II activities.

Approximately 500 volunteers participate in the various workshops each year. An "Introduction to Adopt-A-Stream Program" and "Watershed Walk" videos have been produced, duplicated and distributed on loan. The Georgia Adopt-A-Stream Program Manuals have been printed and distributed to approximately 1,000 volunteers. In addition, a bi-monthly newsletter is published and distributed to over 1,000 volunteers. The Annual Georgia Adopt-A-Stream Conference and Awards Ceremony is held each fall. The Georgia Adopt-A-Stream Program assists EPD in organizing the Annual Georgia River Clean-Up Week each fall, with over 1000 volunteers cleaning up river segments in over 50 locations. In addition, the Georgia Adopt-A-Stream Program conducts numerous presentations around the State.

As of January 1998, there were 30 active Adopt-a-Stream groups in the Coosa basin. These groups and contacts are listed in Appendix F.

Nonpoint Source Education: Project WET (Water Education for Teachers)

A report outlining a plan for nonpoint source education in Georgia was completed in 1994. Titled Georgia Urban Waterbody Education Plan and Program, the plan laid out nonpoint education strategies for seven target audiences: general public, environmental interest organizations, civic associations, educators, business associations, local government officials, and state government officials. Given limited resources and the scope of effort required to target each of these audiences concurrently, EPD decided to initially target nonpoint source education efforts toward educators and students in grades K-12. As described above, EPD is currently targeting initial nonpoint education activities toward educators and students in grades K-12. To reach this target audience, EPD has focused on implementing Project WET, a water resources education curriculum which focuses on nonpoint pollution. Covering impacts on groundwater and on surface water, the curriculum addresses the following nonpoint sources: agriculture, forestry, urban, and construction. It is recognized nationally and internationally and is readily adaptable to fit the State's Quality Core Curriculum requirements. To date, nonpoint source concerns have not received significant emphasis in water resources education efforts in Georgia. Implementation of Project WET will address this gap, providing educators and students in grades K-12 with an understanding of the problems caused by nonpoint source pollution and of the tools that can be used to prevent, control or abate nonpoint source impacts.

EPD began implementing Project WET in December 1996. In 1997 Project WET Facilitator Training Workshops were successfully completed in Alpharetta, Macon, and Savannah, Georgia. Currently there are 86 Project WET Facilitators in Georgia.

In 1997, 32 Project WET Educator Workshops were successfully completed in Georgia statewide, with over 500 educators receiving certified Project WET training and implementing the Project WET Curriculum in classrooms. In addition to Project WET Facilitator Training and Educator Workshops, 40 Project WET Demonstration Workshops were presented to teachers and environmental educators throughout Georgia. A newsletter is published and distributed quarterly with program updates, workshop schedules, information about available resources, reports about classroom activities, and success stories. After three years, it is expected that a cooperating agency will assume responsibility for on-going Project WET activities. At that time, the focus of the state's NPS education activities will be re-evaluated and, depending on the focus of education efforts undertaken by other entities, another of the audiences identified in the 1994 education plan may be targeted.

7.2.7 Ground Water Protection Strategies

In 1984, EPD developed its first management plan to guide the management and protection of Georgia's ground water quantity and quality. The current version, Georgia

Geologic Survey Circular 11, published in 1996, is the basis of Georgia's application to be certified by U.S. EPA for a Comprehensive State Ground Water Protection Plan (CSGWPP). The goal of Georgia's ground water management plan is:

> . . . to protect human health and environmental health by preventing and mitigating significant ground water pollution. To do this, Georgia will assess, protect, and, where practical, enhance the quality of ground waters to levels necessary for current and projected future uses for public health and significant ecological systems.

The goal recognizes that not all ground water is of the same value. The Division's goal is primarily preventive, rather than curative; but it recognizes that nearly all ground water in the state is usable for drinking water purposes and should remain so. EPD pursues this goal through a policy of anti-degradation by which ground water resources are prevented from deteriorating significantly, preserving them for present and future generations. Selection of this goal means that aquifers are protected to varying degrees according to their value and vulnerability, as well as their existing quality, current use, and potential for future use.

EPD has adequate legal authority to prevent ground water from being significantly polluted and to clean-up ground water in the unlikely event pollution were to occur. Extensive monitoring has shown that incidents of ground water pollution or contamination are uncommon in Georgia; no part of the population is known to be at risk.

In general, the prevention of ground water pollution includes—(1) the proper siting, construction, and operation of environmental facilities and activities through a permitting system; (2) implementation of environmental planning criteria by incorporation in land-use planning by local government; (3) implementation of a Wellhead Protection Program for municipal drinking water wells; (4) detection and mitigation of existing problems; (5) development of other protective standards, as appropriate, where permits are not required; and (6) education of the public to the consequences of ground water contamination and the need for ground water protection.

Ground water pollution is prevented in Georgia through various regulatory programs (administered by the State's Department of Natural Resources) which regulate the proper siting, construction, and operation of the following:

- Public water supply wells, large irrigation wells and industrial wells withdrawing more than 100,000 gallons per day.
- Injection wells of all types.
- Oil and gas wells (including oil and gas production).
- Solid waste handling facilities.
- Hazardous waste treatment/storage/disposal facilities.
- Municipal and industrial land treatment facilities for waste and wastewater sludge.
- Municipal and industrial discharges to rivers and streams.
- Storage/concentration/burial of radioactive wastes.
- Underground storage tanks.

EPD prevents the contamination of ground water used for municipal drinking water through an EPA-approved Wellhead Protection Program. As a result of this program, certain new potentially polluting facilities or operations are restricted from wellhead protection areas, or are subject to higher standards of operation and/or construction. EPD also encourages local governments to adhere to the *Criteria for the Protection of*

Groundwater Recharge Areas (a section of the Rules for Environmental Planning Criteria), which define higher standards for facility siting, operation, and clean-up in significant ground water recharge areas. The most stringent guidelines of these criteria pertain to those recharge areas with above average ground water pollution susceptibility indexes.

Additionally, EPD has legal authority under the Georgia Water Quality Control Act to clean up ground water pollution incidents. Additional clean up authority occurs as special trust funds established to clean up leaking underground storage tanks, abandoned hazardous waste sites, and scrap tire dumps.

Most laws providing for protection and management of ground water are administered by EPD. Laws regulating pesticides are administered by the Department of Agriculture, environmental planning by the Department of Community Affairs; and on-site sewage disposal, by the Department of Human Resources. EPD has established formal Memoranda of Understanding (MOU) with these agencies. The Georgia Groundwater Protection Coordinating Committee was established in 1992 to coordinate groundwater management activities between the various departments of state government and the several branches of EPD.

7.3 Targeted Management Strategies

This section describes specific management strategies that are targeted to address the concerns and priority issues for the Coosa River basin that were described in Section 6. Strategies are presented for each issue of concern, with divisions by geographic area as appropriate. For each of the identified concerns, the management strategy statement consists of five components: a problem statement (identical to that given in Section 6), general goals, ongoing efforts, identified gaps and needs, and strategies for action. The purpose of these statements is to provide a starting point for key participants in the subbasin to work together and implement strategies to address each priority concern. In some cases, a strategy may simply consist of increased monitoring; in other situations, the stakeholders in the subbasin will need to develop innovative solutions to these water quality issues. While EPD will continue to provide technical oversight, conduct monitoring surveys, and evaluate data on a basinwide scale, locally-led efforts in the subbasins will be required to help to monitor, assess, restore and maintain the water quality throughout the Coosa River basin.

7.3.1 Metals

Problem Statement

Water use classifications were not fully supported in several water body segments due to exceedances of the water quality standards for metals. These water quality exceedances are found in a number of stream segments in the Coosa River basin and are primarily attributed to nonpoint sources, both rural and urban (for a complete listing of affected stream segments see Appendix E). A common strategy is proposed for addressing metals throughout the basin. However, achieving standards in individual stream segments will depend on the development of site-specific local management plans.

Conasauga River (Hydrologic Unit 03150101)

The water use classification of fishing or wild/scenic was not fully supported in one Conasauga River mainstem segment and in seven tributary stream segments due to exceedances of the water quality standards for metals. Lead standards were exceeded in the river due to a water pollution control plant discharge; zinc, copper and/or cadmium

were exceeded in tributary stream segments due primarily to nonpoint sources in six segments and to a water pollution control plant discharge in one segment.

Oostanaula River (Hydrologic Unit 03150103)

The water use classification of fishing was not fully supported in four tributary stream segments due to exceedances of the water quality standards for metals. Lead, copper and/or mercury standards were exceeded in the tributary stream segments due to nonpoint sources in two segments and to a water pollution control plant discharge in two segments.

Etowah River (Hydrologic Unit 03150104)

The water use classification of fishing was not fully supported in one Etowah River mainstem segment and in nine tributary stream segments due to exceedances of the water quality standards for metals. Copper standards were exceeded in the river due to nonpoint sources; copper, lead, zinc, and/or cadmium were exceeded in tributary stream segments due primarily to urban runoff.

Coosa River below Rome; Chattooga River (Hydrologic Unit 03150105)

The water use classification of fishing was not fully supported in one Coosa River mainstem segment and in one Chattooga River mainstem segment due to exceedances of the water quality standards for metals. Lead standards were exceeded in the Coosa River due to urban runoff; copper and lead were exceeded in the Chattooga River due to a water pollution control plant discharge.

General Goals

Meet water quality standards to support designated water uses.

Ongoing Efforts

The primary contributor of metals to streams are nonpoint sources. In cases where a water pollution control plant was the likely cause of the elevated metals concentration, EPD has taken enforcement action through the NPDES permitting process to require compliance with NPDES permit limits for metals.

Identified Gaps and Needs

The EPD is concerned with the accuracy of many of the stream assessments showing criteria violations for metals, as, in many cases, the metals database was minimal with as little as one data point showing a concentration in excess of stream standards. Further, there are quality assurance concerns with much of the earlier metals data, as it is now evident that clean and ultra clean techniques for sample collection and laboratory testing are necessary to produce quality assured data. Thus, the first step to address this issue will be to collect additional samples using clean techniques to determine if water quality standards are actually being exceeded.

It is also unclear how occasional standards violations translate into actual risk to aquatic life. Georgia standards for metals may need to be reevaluated in light of recent EPA guidance on use of the dissolved fraction of total metal concentrations to calculate risk to aquatic life. Additional biological monitoring may be appropriate to measure impacts along with concentrations of metals. Restoration goals for urban streams are not clearly defined. Consideration should be given to the interaction of metals and habitat degradation: mitigation of metals may have little beneficial impact unless habitat issues are also addressed. It is probable, however, that streams with highly urbanized watersheds cannot be restored to pristine "natural" conditions.

Strategies for Action

Addressing metals from nonpoint sources will be a complex task. An initial task will be to conduct additional monitoring to document if water quality standards are actually being exceeded.

Key Participants and Roles

- EPD will monitor and assess use support in listed waters; continue to enforce point source compliance with metal limits through the NPDES permitting program; and conduct additional monitoring to document metals concentrations in segments affected by nonpoint sources of metals.
- Other participants would be identified contingent on further analysis to confirm metal concentrations and on identification of potential sources.

Specific Management Objectives

Encourage and facilitate local government watershed planning and management to ensure that designated water uses are supported.

Management Option Evaluation

EPD will take the lead in conducting additional monitoring to confirm if water quality standards are being exceeded. If violations are documented, EPD will develop a plan to assess sources and identify alternative solutions.

Action Plan

- EPD will complete a review of existing metals data in listed segments by September 2000, in accordance with the statewide RBMP management cycle.
- EPD will propose a plan for resampling of streams identified as not supporting or partially supporting designated uses and complete sampling by December 2001, in accordance with the statewide RBMP management cycle.
- EPD will continue to administer the storm water regulations and will encourage local planning to address storm water management.
- EPD will continue to develop Rapid Bio-assessment Protocol capabilities designed to assess impairment of aquatic life.
- Local governments may opt to develop a Storm Water Management Plan to address the urban runoff concerns.
- The basin team will re-evaluate stream status and management strategies during the next basin cycle, scheduled for 2002.

Methods for Tracking Performance

Progress in management of urban and industrial storm water will be tracked through ongoing sampling efforts and by possible biological monitoring studies. An evaluation of the status of listed water bodies will be made coincident with the next iteration of the RBMP management cycle for the Coosa basin in 2002.

7.3.2 Fecal Coliform Bacteria

Problem Statement

Water use classifications for fishing or drinking water were not fully supported in several water body segments due to excursions of the water quality standards for fecal coliform bacteria. These water quality excursions are found in a number of stream segments in the Coosa River basin and are primarily attributed to nonpoint sources, both rural and urban. A common strategy is proposed for addressing fecal coliform bacteria throughout the basin. However, achieving standards in individual stream segments will depend on the development of site-specific local management plans.

Conasauga River (HUC 03150101)

The water use classification of fishing or drinking water was not fully supported in two Conasauga River mainstem segments and two tributary stream segments due to exceedances of the water quality standard for fecal coliform bacteria. These may be attributed to a combination of urban runoff, septic systems, sanitary sewer overflows, rural nonpoint sources and/or animal wastes.

Coosawattee River (HUC 03150102)

The water use classification of fishing was not fully supported in one Coosawattee River mainstem segment and eight tributary stream segments due to exceedances of the water quality standard for fecal coliform bacteria. Four are attributed to urban nonpoint sources and five to rural nonpoint sources. Excursions of fecal coliform bacteria standards result from a combination of urban runoff, septic systems, sanitary sewer overflows, rural nonpoint sources and/or animal wastes.

Oostanaula River (HUC 03150103)

The water use classification of fishing or drinking water was not fully supported in two Oostanaula River mainstem segments and two tributary stream segments due to exceedances of the water quality standard for fecal coliform bacteria. These may be attributed to a combination of urban runoff, septic systems, sanitary sewer overflows, rural nonpoint sources and/or animal wastes.

Etowah River (HUC 03150104)

The water use classification of fishing was not fully supported in three Etowah River mainstem segments and 22 tributary stream segments due to exceedances of the water quality standard for fecal coliform bacteria. These may be attributed to a combination of urban runoff, septic systems, sanitary sewer overflows, rural nonpoint sources and/or animal wastes.

Coosa River below Rome and Chattooga River (HUC 03150105)

The water use classification of fishing was not fully supported in two Coosa River mainstem segments, two Chattooga River mainstem segments and in four tributary stream segments due to exceedances of the water quality standard for fecal coliform bacteria. These may be attributed to a combination of urban runoff, septic systems, sanitary sewer overflows, rural nonpoint sources and/or animal wastes.

General Goals

Meet water quality standards to support designated water uses.

Ongoing Efforts

The primary source of exceedance of water quality standards for fecal coliform bacteria in the Coosa River basin is urban nonpoint source runoff. Septic tanks and sanitary sewer overflows may also contribute to the problem.

Agriculture is making progress in controlling bacterial loads. Considerable effort has been directed toward animal confinement areas. Georgia Universities and agricultural agencies or groups are conducting several agricultural efforts with statewide implementations. Sustainable Agriculture and Farm*A*Syst. Training will be scheduled in the near future within the basin. The UGA and ARS have proposals in for assessing nutrient and coliform reducing BMPs on 10 farms that will have statewide implications. Soil and Water Conservation Districts annually convene Local Work Groups (LWGs) which are comprised of resource professionals from a variety of disciplines and interested stakeholders at the local level, to identify resource concerns in their area. These LWGs develop proposals for USDA or other funding to address identified resource concerns.

Within the Conasauga basin, there is an ongoing NRCS, RC&D, and Conservation District natural resources assessment within the basin as well as the Conasauga Alliance effort. These efforts mostly deal with reducing sediment and pollutants associated with animal waste. In addition, EPA and NRCS, in cooperation with the agricultural community in Georgia, are conducting field inventories to verify agricultural contributions to water quality impairments on streams for which a TMDL has been established.

Identified Gaps and Needs

Sources of fecal coliform bacteria in many stream segments are not clearly defined. In some cases, fecal bacterial loads may be attributable to natural sources (e.g., wildlife); alternative bacteriological sampling methods may be useful to distinguish between human, other mammalian, and avian fecal coliform sources. Sanitary sewer leaks and overflows may be a source of fecal coliforms. In addition, previous sampling was not conducted at a sufficient frequency to determine whether the monthly geometric mean criterion specified in the standard has actually been violated. Thus, an initial effort in the next RBMP cycle may be to collect an adequate number of samples (four over a 30-day period) to support geometric mean calculations to determine if water quality standards are actually being exceeded.

Many coliform reducing practices are expensive and the percentage of reduction is often unknown. Many landowners are reluctant to spend today's dollars for long term amortization in uncertain futures markets. Agricultural BMPs and cost share dollars (Farm Bill and Section 319 funds) and loans need to be concentrated in priority watersheds with sufficient technical workforce to implement enough BMPs through long term agreements or contracts to reduce sediment loading by 70 to 80 percent.

Strategies for Action

Separate strategies are needed to address nonpoint fecal coliform bacteria loadings for urban and rural sources.

A. Strategies for Urban Sources

Addressing urban runoff will be a complex task, and will require implementation of watershed pollution control programs by local governments. Management of urban runoff is needed to address a variety of water quality problems, including metals, fecal coliform bacteria, nutrients, and habitat degradation. For this five year phase of the basin

management cycle, management will concentrate on source control and planning. Evaluation of the efficacy of this approach will be made during the basin strategy re-evaluation scheduled for October 2001-September 2002, in accordance with the statewide RBMP management cycle.

Key Participants and Roles

- EPD will monitor and assess use support in listed stream segments and encourage local efforts to address nonpoint source pollution.
- Local governments will continue to operate and maintain their sewer systems and wastewater treatment plants, monitor land application systems, and develop and implement regulations, zoning and land use planning, implement local watershed initiatives, and monitoring programs.
- Local municipalities should work with the local health departments to identify locations of septic systems and educate owners about the proper care and maintenance of septic systems.
- Citizen groups will implement Adopt-A-Stream programs, and work with local governments in implementing watershed initiatives.

Specific Management Objectives

Facilitate local watershed planning and management to ensure that designated water uses are supported.

Management Option Evaluation

Integrated management options will be proposed, implemented, and evaluated by local governments.

Action Plan

- EPD will continue to ensure that all permitted point sources remain in compliance with permitted effluent limitations for fecal coliform bacteria. EPD will also request a comprehensive watershed assessment, looking at both point and nonpoint sources, from localities applying for new or expanded NPDES point source discharge permits. The intent is to direct localities' attention to current and future nonpoint source issues in their watershed and to have them consider ways to prevent or control water quality impacts due to growth. Approved watershed management steps will be included as a condition for expansion of existing water pollution control plants or construction of new plants.
- EPD will continue to administer the program and encourage local planning to address management.
- EPD will encourage local authorities to institute programs to identify and address illicit sewage discharges, leaks and overflows of sanitary sewers, and failing septic tanks within their jurisdictions.
- EPD will encourage citizen involvement through Adopt-A-Stream groups to address restoration of urban streams.
- EPD will complete reassessment of fecal coliform bacteria monitoring protocols and will propose a plan for resampling of streams identified as not supporting or partially supporting designated uses and complete sampling by December, 2001, in accordance with the statewide RBMP management cycle.

Method for Tracking Performance

EPD tracks point source discharges through inspections and evaluations of self-monitoring data. An evaluation of the status of listed waterbodies will be made coincident with the next iteration of the RBMP management cycle for the Coosa River basin in 2002.

B. Strategies for Rural Sources

Agricultural cost share dollars (Farm Bill and Section 319 funds) and loans need to be concentrated in priority watersheds with sufficient technical workforce to implement enough BMPs through long term agreements or contracts.

Key Participants and Roles

- EPD will monitor and assess use support in listed streams, encourage local planning efforts, regulate point sources under the NPDES program.
- GSWCC and local SWCDs and RC&D councils with assistance from NRCS: promote implementation of agricultural best management practices. Local SWCDs will convene Local Work Groups to identify local resource concerns and develop proposals for funding to address these concerns.
- Citizen groups will implement Adopt-A-Stream programs, and work with local governments in implementing watershed initiatives.
- Local municipalities should work with the local health departments to identify locations of septic systems and educate owners about the proper care and maintenance of septic systems.

Specific Management Objectives

Encourage and facilitate local watershed planning and management to ensure that designated water uses are supported.

Management Option Evaluation

Evaluation will be on a site-by-site basis. For agricultural BMP support, existing prioritization methods of the agricultural agencies will be used.

Action Plan

- EPD will continue to ensure that all permitted point source discharges remain in compliance with fecal coliform bacteria limits.
- EPD will continue monitoring and assessment of Land Application Systems.
- GSWCC and local agricultural agencies will continue to support adoption of BMPs for animal waste handling and will follow up on complaints related to coliform bacteria derived from agriculture. Methods for prioritization and implementation of cost-share incentives under the 1996 Farm Bill will be targeted to areas of apparent water quality impact, including rural streams which may sustain excessive fecal coliform loads from animal and cropland operations.
- DHR is in the process of developing new regulations for septic systems. DHR will work to educate local governments and citizen groups about the need for adequate regulation and maintenance of septic systems to protect water quality.

DHR will also utilize the criteria presented in the Growth Planning Act for septic system setbacks from high value waters.

Method for Tracking Performance

Agricultural agencies will track rates of BMP implementation for cropland and animal operations. An evaluation of the status of listed waterbodies will be made coincident with the next iteration of the RBMP management cycle for the Coosa River basin in 2002.

7.3.3 Erosion and Sedimentation

Problem Statement

Water use classifications for fishing or drinking water are potentially threatened in many water body segments by erosion and loading of sediment which can alter stream morphology, impact habitat, and reduce water clarity. Potential sources include urban runoff and development (particularly construction), unpaved rural roads, stream erosion (including headcutting, bank erosion, and shifting of the bedload), forestry practices, and agriculture. Threats from sediment load are possible throughout the Coosa River basin, although there are no stream segments listed at this time in the basin as not fully supporting designated water uses due to sedimentation. A common strategy is proposed for addressing erosion and sedimentation throughout the basin. However, achieving standards in individual stream segments will depend on the development of site-specific local management plans.

Conasauga River (HUC 03150101)

GSWCC estimates that there are 43,600 agricultural acres within HUC 03150101 and that 15,150 of those acres are eroding above the soil loss tolerance. The Conasauga basin was selected as a 1997 USDA-EQIP priority area and allocated $111,700 targeted for livestock concerns. The basin is also a number 2 priority area for the 1998 USDA-EQIP program. There is a Conasauga River Alliance between the Limestone Valley Resource Conservation Council, The Nature Conservancy, UGA, NRCS, and the Tennessee Aquarium. This project promotes the installation and use of agricultural BMPs in the upper part of the basin with the stated goal of protecting and preserving the aquatic diversity of the Conasauga River above Highway 76 in Georgia and Tennessee. Through these unique partnerships agricultural producers and other landowners are developing riparian buffers that serve as nonpoint source pollutant filters to help maintain and improve the water quality in the Conasauga, and create additional habitat for wildlife.

GFC conducted statewide BMP Compliance Surveys in 1991 and again in 1992 and is in the process of conducting one in 1998. During the 1992 survey, the GFC evaluated 357 acres in the Conasauga basin and determined that, of the activities, 89 percent of the roads and 99 percent of the harvested acres were in compliance with BMPs. No site prepared acres or regenerated acres were evaluated.

Coosawattee River (HUC 03150102)

GSWCC estimates that there are 84,800 agricultural acres within HUC 03150102 and that 18,400 of those acres are eroding above the soil loss tolerance. The Coosawattee basin was selected as a 1997 USDA-EQIP priority area and allocated $127,000 mostly targeted for livestock concerns. NRCS, the Coosa River Soil and Water Conservation District, and the Limestone Valley District are also conducting a model farm demonstration in Gilmer County. This demonstration focuses on practices that promote livestock production efficiency and BMP installation, operation, and maintenance.

During the 1992 survey, the GFC evaluated 260 acres in the Coosawattee basin and determined that, of the activities, 72 percent of the roads, 96 percent of the harvested acres, and 98 percent of the site prepared acres were in compliance with BMPs. No regenerated acres were evaluated.

Oostanaula River (HUC 03150103)

GSWCC estimates that there are 90,900 agricultural acres within HUC 03150103 and that 17,800 of those acres are eroding above the soil loss tolerance. Grazing land training and livestock BMP demonstrations are being conducted at Berry College in cooperation with CES, NRCS, GSWCC, and the Coosa River Soil and Water Conservation District through a Section 319 Grant. In this project, the principles of grazing land management are being displayed, including rotational grazing, forage management, and other practices that increase the health and vigor of a cattle herd and the forage they consume. The basin has also been selected as a USDA-EQIP 1997 priority area and allocated $80,000 targeted mostly for livestock concerns.

During the 1992 survey, the GFC evaluated 336 acres in the Oostanaula basin and determined that, of the activities, 91 percent of the roads and 98 percent of the harvested acres were in compliance with BMPs. No site prepared acres or regenerated acres were evaluated.

Etowah River (HUC 03150104)

GSWCC estimates that there are 212,800 agricultural acres within HUC 03150104 and that 36,150 of those acres are eroding above the soil loss tolerance. The basin has been selected as a USDA-EQIP 1997 priority area and allocated $96,100 targeted for livestock concerns.

During the 1992 survey, the GFC evaluated 1,161 acres in the Etowah basin and determined that, of the activities, 89 percent of the roads, 95 percent of the harvested acres, 69 percent of the site prepared acres, and 100 percent of the regenerated acres were in compliance with BMPs.

Coosa River below Rome and Chattooga River (HUC 03150105)

GSWCC estimates that there are 86,000 agricultural acres within HUC 03150105 and that 18,500 of those acres are eroding above the soil loss tolerance. Coosa River basin has been selected as a 1997 USDA-EQIP priority area with $79,000 targeted for livestock concerns and the Armuchee Creek Watershed has been selected as a number 2 priority for 1998 USDA-EQIP funding. Also there is a NW Georgia Coalition working with rural water quality issues in the Basin.

During the 1992 survey, the GFC evaluated 305 acres in the Coosa/Chattooga basin and determined that, of the activities, 54 percent of the roads, 92 percent of the harvested acres, and 98 percent of the site prepared acres were in compliance with BMPs. No regenerated acres were evaluated.

General Goals

Control erosion and sedimentation from land disturbing activities in order to meet narrative turbidity water quality standards and support designated uses.

Ongoing Efforts

Forestry and Agriculture have voluntary E&SC programs built around implementation of BMPs. Both Forestry and Agriculture have a water quality complaint resolution procedure in place. GSWCC recently updated and is distributing the *Manual for Erosion and Sediment Control in Georgia* and the *Field Manual for Erosion and Sediment*

Control in Georgia. The GSWCC with its agricultural partners have produced and distributed three E&SC pamphlets; "Guidelines for Streambank Restoration", "A Guide to Controlling Erosion with Vegetation", and "Agricultural Best Management Practices". These and numerous other E&SC related pamphlets and other informational materials are available in agricultural offices through out the State. Soil and Water Conservation Districts annually convene Local Work Groups (LWGs) which are comprised of resource professionals from a variety of disciplines and interested stakeholders at the local level, to identify resource concerns in their area. These LWGs develop proposals for USDA or other funding to address identified resource concerns.

Forestry has made significant E&SC progress. GFC has been and is specifically targeting those landowner groups and regions with low compliance for increased BMP education through local talks, workshops, and demonstrations including the Georgia Forestry Association's and the American Forest and Paper Association's (AF&PA) sponsored Master Timber Harvesters Workshop. It is that group's goal to train every logger in the State on BMPs. In addition, the Georgia State Board of Registration for Foresters requires every licensed forester to implement BMPs as a minimum standard of practice. The new Forestry BMPs, scheduled for printing in June 1998, will cause additional sedimentation reductions and leave more riparian tree cover over perennial and intermittent streams when they become standard within the industry.

EPD serves as an "Issuing Authority" in those localities across the State that do not have a local Erosion and Sedimentation Control Ordinance or Program. EPD provides permitting, inspection, compliance, and enforcement services in these areas.

There are several urban focused erosion educational initiatives underway. Each year GSWCC and EPD conduct 5 formal E&SC courses to provide training to the regulated community, regulators, consultants, and interested citizens. GSWCC also provides detailed E&SC training for 8 to 11 units of government each year. A task force established by the Lieutenant Governor, the Erosion and Sediment Control Technical Study Committee, also known as DIRT II, is assessing the economic and environmental impacts of erosion prevention and sediment control BMPs for urban construction sites. Another urban initiative is the U.S. Forest Service's Planting Along Stream Sides (PASS) which deals with vegetative plantings to reduce erosion from streambanks.

Large portions of HUCs 03150101, 03150102, and 03150103 are managed by the US Forest Service as part of the Chattahoochee National Forest. Management of the National Forest is prescribed in a Land and Resource Management Plan, which specifies the standards and guidelines and appropriate timing and vicinity of allowed practices. Five management areas are of particular significance to the Coosa River basin:

- Management Area 1: Wilderness areas, including the 35,233 acre Cohutta Wilderness Area. The management goals are to "Preserve the areas wilderness character and manage for future use and enjoyment as wilderness". Timber harvest and road construction is not allowed in these areas except under emergency conditions.
- Management Area 11: Major recreation areas and adjoining lands dominated by riparian vegetation. The management goals are to manage these areas in a near-natural condition for their value to wildlife, recreation, fishery, aquatic habitat, and water quality, while emphasizing the protection or enhancement of the major recreation trout streams, the adjoining lands, and associated vegetation. Timber harvesting is permitted, but with an objective of protecting riparian and recreation values.
- Management Area 12: Major lakes, vistas, and seen areas. The management goal is to maintain a visually appealing landscape. Timber harvesting is permitted, but clearcutting is subject to strict limitations.

- Management Area 15: Non-motorized recreational areas which have a goal of maintaining a setting characterized by a predominantly natural or natural-appearing environment. Timber harvesting is permitted, but clearcutting is discouraged and no more than 10 percent of each geographical component of the management area will be clearcuts in the 0 to 10 year age class.
- Management Area 16: The general forest area, which contains the majority of the National Forest and is managed in compliance with the Multiple-Use Sustained Yield Act of 1960. While the primary focus is on renewable resource production, special protection is provided for protection of unique and delicate resources. General prescriptions for road and skid trail construction and maintenance, vegetation management, timbering and reforestation, watershed improvement, and erosion protection apply.

Identified Gaps and Needs

Adverse impacts of excess sediment loading include degradation of habitat and reduction in species diversity. These types of impacts are best addressed through biological monitoring, for which improved capabilities are needed. EPD is developing increased capability for biomonitoring using Rapid Bioassessment Protocols (RBPs) for benthic macroinvertebrates. The EPD protocols include habitat assessment. The WRD is working with the IBI (Index of Biotic Integrity) to assess fish communities. These tools will provide methods to detect and quantify impairment of aquatic life resulting from habitat-modifying stressors such as sediment, as well as impacts from other stressors.

A key for addressing erosion, sedimentation, and habitat issues on highly impacted streams is definition of appropriate management goals. Many highly impacted streams cannot be returned to "natural" conditions. An appropriate restoration goal needs to be established in consultation between EPD partners and other stakeholders.

Many privately owned sawmills are not members of the AF&PA and there is no good way of requiring these mills and their producers to come to the Master Timber Harvesters Workshops. The GFC, UGA, GFA, and the Southeastern Wood Producers Association are working on a solution. There is still a need for education of private landowners who are selling timber for the last time prior to land development. Many such landowners attempt to maximize return on timber, sometimes at the expense of BMPs.

Much of the sediment being produced and adversely impacting streams and lakes is associated with road development and maintenance. In many instances E&SC plans, implementation, inspection and enforcement are not adequate on DOT and county sponsored road projects. Without aggressive inspection and enforcement, contractors sometimes tend to let erosion problems happen and attempt to mitigate after the fact. Georgia DOT and other agencies charged with E&SC need to work with county road departments in identifying road segments that are high sediment producers and recommend abatement measures. Further monitoring may be needed to quantify the impact of unpaved rural roads as a source of sedimentation into streams.

Strategies for Action

Understanding the role of erosion and sedimentation in urban streams is incomplete at this time. Most of these streams are impacted by a variety of stressors. An incremental or phased approach is needed to address these issues.

Most agricultural sediment reduction practices are expensive and landowners are reluctant to spend today's dollars for long term BMP amortization in uncertain future markets. Agricultural cost share dollars (Farm Bill) and perhaps low interest loans (Clean Water Act State Revolving Fund) need to be concentrated in priority watersheds with

sufficient technical workforce to implement enough BMPs through long term agreements or contracts to reduce sediment loading.

Key Participants and Roles

- EPD will encourage local government water quality improvement efforts; and continue the development of biomonitoring methods.
- Local governments will enforce erosion controls for construction practices and implement land use planning.
- GSSWC and local SWCDs and RC&D Councils with assistance from NRCS will encourage the implementation of BMPs to control erosion of agricultural lands. Local SWCDs will convene Local Work Groups to identify local resource concerns and develop proposals for funding to address these concerns.
- GFC will encourage implementation of forestry BMPs.
- Citizen groups will implement Adopt-A-Stream programs and work with local governments in implementing watershed initiatives.

Specific Management Objectives

Control erosion and sedimentation from land disturbing activities in order to meet narrative water quality standards.

Management Option Evaluation

During this iteration of the basin cycle, management will focus on source control BMPs.

Action Plan

- GSSWC and local SWCDs and RC&D Councils with assistance from NRCS will encourage the implementation of BMPs to control erosion of agricultural lands.
- GFC will target landowner and user groups for BMP education to encourage compliance with forestry BMP guidelines.
- EPD will work with local governments with issuing authority for erosion and sedimentation controls first through education and second through enforcement to control erosion at construction sites, and will encourage local governments to implement land use planning.
- EPD will encourage citizen involvement through Adopt-A-Stream groups to address restoration of urban streams
- EPD and WRD will continue to develop biological monitoring capabilities designed to assess aquatic life.

Method for Tracking Performance

GSWCC, GFC, EPD, and issuing authorities will track BMP implementation: GSWCC by the number of E&SC plans reviewed and DAT evaluations and recommendations; GFC through its biennial surveys; and EPD through routine inspections of permitted projects, surveillance for any noncompliance, and the conduct of necessary compliance and enforcement activities. NRCS will track BMP implementation through its NIMS reporting system.

7.3.4 Fish Consumption Guidelines

Conasauga River Basin (HUC 03150101)

Problem Statement

The water use classification of fishing was not fully supported in one tributary stream segment (Swamp Creek) based on fish consumption guidelines due to mercury. The guidelines are for redeye bass.

General Goals

Work to protect human health by providing guidelines for consumption of fish.

Ongoing Efforts

DNR has monitored fish and issued fish consumption guidelines. There are no known point source discharges of mercury in the watershed. However, mercury is a naturally occurring metal that recycles between land, water and air. As mercury cycles through the environment it is absorbed and ingested by plants and animals. Most of the mercury absorbed will be returned to the environment but some will remain in plant and animal tissues. Mercury may also be present in fish due to mercury content in the soils, from municipal and industrial sources, or from fossil fuel use. It is also possible that the elevated mercury level is related to global atmospheric transport.

Identified Gaps and Needs

The source of mercury is not well quantified. Mercury within Swamp Creek is likely derived from natural sources or from atmospheric deposition.

Strategies for Action

Because the load mercury is not originating from any known point sources, the strategy is to keep the fishing public notified of risks associated with fish consumption.

Key Participants and Roles

- EPD and WRD to sample the fish tissue and issue the fish consumption guidelines as appropriate.

Specific Management Objectives

EPD and WRD will work to protect public human health by issuing fish consumption guidelines as needed, indicating the recommended rates of consumption of fish from specific waters. The guidelines are based on conservative assumptions and provide the public with factual information for use in making rational decisions regarding fish consumption.

Action Plan

- WRD and EPD will continue to sample and analyze fish tissue and issue fish consumption guidelines as needed. The next round of fish tissue sampling for this reach will be considered in 2002 in accordance with the river basin monitoring cycle.
- EPD will evaluate the need for additional sampling (*e.g.*, sediment sampling) to determine sources of Mercury during the next iteration of the Coosa River basin management cycle.

Method of Tracking Performance

Trends in fish tissue concentration; number of Fish Consumption Guidelines required.

Coosawattee River Basin (HUC 03150102)

Problem Statement

The water use classification of fishing was not fully supported in one tributary segment (Talking Rock Creek) and in Carters Lake based on fish consumption guidelines due to mercury. The guidelines are for redeye bass in the tributary and walleye in the lake.

General Goals

Work to protect human health by providing guidelines for consumption of fish.

Ongoing Efforts

DNR has monitored fish in Carters Lake and issued fish consumption guidelines. There are no known point source discharges of mercury in the watershed. However, mercury is a naturally occurring metal that recycles between land, water and air. As mercury cycles through the environment it is absorbed and ingested by plants and animals. Most of the mercury absorbed will be returned to the environment but some will remain in plant and animal tissues. Mercury may also be present in fish due to mercury content in the soils, from municipal and industrial sources, or from fossil fuel use. It is also possible that the elevated mercury level is related to global atmospheric transport.

Identified Gaps and Needs

The source of mercury is not well quantified. Mercury within Carters Lake is likely derived from natural sources or from atmospheric deposition.

Strategies for Action

Because the load mercury is not originating from any known point sources, the strategy is to keep the fishing public notified of risks associated with fish consumption.

Key Participants and Roles

- EPD and WRD to sample the fish tissue and issue the fish consumption guidelines as appropriate

Specific Management Objectives

EPD and WRD will work to protect public human health by issuing fish consumption guidelines as needed, indicating the recommended rates of consumption of fish from specific waters. The guidelines are based on conservative assumptions and provide the public with factual information for use in making rational decisions regarding fish consumption.

Action Plan

- WRD and EPD will continue to sample and analyze fish tissue and issue fish consumption guidelines as needed. The next round of fish tissue sampling for this reach will be considered in 2002 in accordance with the river basin monitoring cycle.
- EPD will evaluate the need for additional sampling (*e.g.*, sediment sampling) to determine sources of Mercury during the next iteration of the Coosa River basin management cycle.

Method of Tracking Performance

Trends in fish tissue concentration; number of Fish Consumption Guidelines required.

Oostanaula River Basin (HUC 03150103)

Problem Statement

The water use classification of fishing was not fully supported in the Oostanaula River mainstream based on fish consumption guidelines due to PCBs. The guidelines are for largemouth bass, smallmouth buffalo and channel catfish.

General Goals

Work to protect human health by providing guidelines for consumption of fish.

Ongoing Efforts

DNR has monitored fish in the Oostanaula River and issued fish consumption guidelines. The source of PCBs within the watershed is thought to have originated from the General Electric facility in Rome. Cleanup operations from the General Electric facility in Rome were completed in 1980.

Identified Gaps and Needs

Although they were banned in 1976, PCBs do not break down easily and remain in sediment for years. It is now illegal to manufacture PCBs; however, in the past, these synthetic oils were regularly used as fluids for electrical transformers, cutting oils, and carbonless paper. Residual contamination in sediment presumably drives fish body burdens, but the cycling of PCBs in the river is not fully characterized.

Strategies for Action

Because the load of PCBs is not originating from any known point sources, the strategy is to keep the fishing public notified of risks associated with fish consumption.

Key Participants and Roles

- EPD and WRD to sample the fish tissue and issue the fish consumption guidelines as appropriate.

Specific Management Objectives

EPD and WRD will work to protect public human health by issuing fish consumption guidelines as needed, indicating the recommended rates of consumption of fish from specific waters. The guidelines are based on conservative assumptions and provide the public with factual information for use in making rational decisions regarding fish consumption.

Action Plan

- WRD and EPD will continue to sample and analyze fish tissue and issue fish consumption guidelines as needed. The next round of fish tissue sampling for this reach will be considered in 2002 in accordance with the river basin monitoring cycle.
- EPD will evaluate the need for additional sampling (*e.g.*, sediment sampling) to determine sources of PCBs during the next iteration of the Coosa River basin management cycle.

Method of Tracking Performance

Trends in fish tissue concentration; number of Fish Consumption Guidelines required.

Etowah River Basin (HUC 03150104)

Problem Statement

The water use classification of fishing was not fully supported in the Etowah River mainstream above and below Lake Allatoona or in Lake Allatoona based on fish consumption guidelines due to PCBs and mercury in the river segment and PCBs in the lake. The guidelines are for largemouth bass, spotted bass, and smallmouth buffalo in the river and carp, white bass, and largemouth bass in the lake.

General Goals

Work to protect human health by providing guidelines for consumption of fish.

Ongoing Efforts

DNR has monitored fish in the Etowah River mainstream and in Lake Allatoona and issued fish consumption guidelines. The source of PCBs within the watershed is thought to have originated from the General Electric facility in Rome. Cleanup operations from the General Electric facility in Rome were completed in 1980.

There are no known point source discharges of mercury in the watershed. However, mercury is a naturally occurring metal that recycles between land, water and air. As mercury cycles through the environment it is absorbed and ingested by plants and animals. Most of the mercury absorbed will be returned to the environment but some will remain in plant and animal tissues. Mercury may also be present in fish due to mercury content in the soils, from municipal and industrial sources, or from fossil fuel use. It is also possible that the elevated mercury level is related to global atmospheric transport.

Identified Gaps and Needs

Although they were banned in 1976, PCBs do not break down easily and remain in sediment for years. It is now illegal to manufacture PCBs; however, in the past, these synthetic oils were regularly used as fluids for electrical transformers, cutting oils, and carbonless paper. Residual contamination in sediment presumably drives fish body burdens, but the cycling of PCBs in the river is not fully characterized. The source of mercury is not well quantified.

Strategies for Action

Because the load of PCBs is not originating from any known point sources and the mercury within the Etowah River and Lake Allatoona is likely derived from natural sources or from atmospheric deposition, the strategy is to keep the fishing public notified of risks associated with fish consumption.

Key Participants and Roles

- EPD and WRD to sample the fish tissue and issue the fish consumption guidelines as appropriate.

Specific Management Objectives

EPD and WRD will work to protect public human health by issuing fish consumption guidelines as needed, indicating the recommended rates of consumption of fish from specific waters. The guidelines are based on conservative assumptions and provide the public with factual information for use in making rational decisions regarding fish consumption.

Action Plan

- WRD and EPD will continue to sample and analyze fish tissue and issue fish consumption guidelines as needed. The next round of fish tissue sampling for

this reach will be considered in 2002 in accordance with the river basin monitoring cycle.

- EPD will evaluate the need for additional sampling (*e.g.*, sediment sampling) to determine sources of PCBs during the next iteration of the Coosa River basin management cycle.

Method of Tracking Performance

Trends in fish tissue concentration; number of Fish Consumption Guidelines required.

Coosa River below Rome and Chattooga River Basin (HUC 03150105)

Problem Statement

The water use classification of fishing was not fully supported in the Coosa River mainstem based on fish consumption guidelines due to PCBs. The guidelines are for largemouth bass, smallmouth buffalo, black crappie, striped bass, and channel catfish.

General Goals

Work to protect human health by providing guidelines for consumption of fish.

Ongoing Efforts

DNR has monitored fish in the Etowah River mainstream and issued fish consumption guidelines. The source of PCBs within the watershed is thought to have originated from the General Electric facility in Rome. Cleanup operations from the General Electric facility in Rome were completed in 1980.

Identified Gaps and Needs

Although they were banned in 1976, PCBs do not break down easily and remain in sediment for years. It is now illegal to manufacture PCBs; however, in the past, these synthetic oils were regularly used as fluids for electrical transformers, cutting oils, and carbonless paper. Residual contamination in sediment presumably drives fish body burdens, but the cycling of PCBs in the river is not fully characterized. The source of mercury is not well quantified.

Strategies for Action

Because the load of PCBs is not originating from any known point sources, the strategy is to keep the fishing public notified of risks associated with fish consumption.

Key Participants and Roles

- EPD and WRD to sample the fish tissue and issue the fish consumption guidelines as appropriate.

Specific Management Objectives

EPD and WRD will work to protect public human health by issuing fish consumption guidelines as needed, indicating the recommended rates of consumption of fish from specific waters. The guidelines are based on conservative assumptions and provide the public with factual information for use in making rational decisions regarding fish consumption.

Action Plan

- WRD and EPD will continue to sample and analyze fish tissue and issue fish consumption guidelines as needed. The next round of fish tissue sampling for this reach will be considered in 2002 in accordance with the river basin monitoring cycle.

- EPD will evaluate the need for additional sampling (*e.g.*, sediment sampling) to determine sources of PCBs during the next iteration of the Coosa River basin management cycle.

Method of Tracking Performance

Trends in fish tissue concentration; number of Fish Consumption Guidelines required.

7.3.5 Nutrients

Excess nutrient loads are a concern for all surface waters, as they promote undesirable growths of floating and attached algae which can degrade habitat, deplete dissolved oxygen, and result in filter clogging and taste and odor problems for public water supply systems. Impacts are typically greatest in lakes and reservoirs; however, nutrients may also stimulate undesirable growths of attached algae in smaller rivers and streams. For this iteration of the Coosa basin plan, nutrients have been identified as a significant issue in three HUCs due to loading of nutrients to reservoirs. These nutrients derive from the entire watershed upstream, and protection of water quality will require basinwide strategies to control nutrient loads.

Coosawattee River (HUC 03150102)

Problem Statement

The water use classifications of fishing and recreation are potentially threatened in Carters Lake due to inputs of nutrients which may cause excess algal growth in the lake. Nutrient sources include water pollution control plant discharges and nonpoint sources from urban and agricultural areas.

General Goals

Meet water quality standards and maintain nutrient loading at levels sufficient to support designated uses within Carters Lake.

Ongoing Efforts

EPD is conducting a Clean Lakes Phase I Diagnostic/Feasibility Study the results of which may be used to develop specific lake water quality standards for Carters Lake. This project was designed as a comprehensive study of Carters Lake and its drainage basin. The Georgia EPD received a grant from the US EPA to conduct the study. Fieldwork for the project was conducted from January 1996 to February 1997. The lake was visited once a month during the colder months and twice a month during the growing season. A total of 7 stations were established for the study: 4 in the lake, 2 below the lake and 1 in the headwaters of the Coosawattee River, the main tributary that feeds into Carters Lake. Data from the seven main tributaries that enter Carters Lake was also collected, once in February, March and November, then twice a month April through October.

Goals of the study were:

- Conduct a year of baseline monitoring and sample collection
- Sample diel dissolved oxygen (DO) in the water column
- Develop a map locating aquatic macrophytes
- Calculate a general nutrient budget from collected data
- Characterize sediments
- Determine priority pollutants in water and fish

- Characterize the watershed for nonpoint source pollutants
- Conduct algal growth potential (AGP) tests
- Determine sediment oxygen demand (SOD) and check pollutants in sediment
- Investigate the effects of "pumpback" by the dam

Lake water samples were analyzed for: Total Phosphorus, Nitrite + Nitrate, Ammonia, TKN, BOD_5, Fecal Coliform, total reactive phosphorus, pH, Alkalinity, Hardness, Conductivity and Chlorophyll *a*. In situ measurement include: Vertical profiles for dissolved oxygen (DO), water temperature, pH, conductivity, water clarity, and air temperature, as well as wind speed and direction. The same parameters were applied to the tributary sampling, adding flow measurement.

The fieldwork has been completed. The report is currently in progress. An initial draft is expected June of this year, with the final report ready by Fall.

The data collected indicates that Carters Lake is a very clean body of water. There is only one point source discharge into the basin, which is the municipal treatment facility in Ellijay, Georgia. Fecal coliform bacteria densities in the Coosawattee River just below Ellijay were slightly elevated in a few samples, but no high counts were found in the lake. Areas of potential concern were all of nonpoint source issues: sedimentation and nutrient level elevation from runoff, especially in the areas draining into the Coosawattee River. Tributary data showed that Flat Creek had elevated levels of bacteria, possibly from septic tank drainage and livestock pen runoff. Talking Rock Creek had some high readings in pH and conductivity, possibly from the weeds that choked off the stream in late summer. Tails Creek had a very high turbidity reading from one sample, possibly from land disturbing activities in the headwaters.

Identified Gaps and Needs

The Clean Lake Study will provide information on nutrient concentrations and sources.

Strategies

Additional point and nonpoint source controls such as agricultural best management practices may be implemented in the watersheds surrounding Carters Lake to minimize nutrient inputs into the lake and comply with future water quality standards.

Etowah River (HUC 03150104)

Problem Statement

The water use classifications of fishing, drinking water, and recreation are potentially threatened in Lake Allatoona due to inputs of nutrients which may cause excess algal growth in the lake. Nutrient sources include water pollution control plant discharges and nonpoint sources from urban and agricultural areas.

General Goals

Meet water quality standards and maintain nutrient loading at levels sufficient to support designated uses within Lake Allatoona.

Ongoing Efforts

EPD is conducting a Clean Lakes Phase I Diagnostic/Feasibility Study the results of which will be used to develop specific lake water quality standards for Lake Allatoona. EPD's Clean Lakes grant was contracted out to the A. L. Burruss Institute of Public Service at Kennesaw State University in 1992, to conduct a Phase 1 Diagnostic

Feasibility Study of Lake Allatoona. Monitoring was conducted over the 1992 - 1996 period. The emphasis of the study is on the assessment of water quality within the lake and the feasibility of watershed protection. The contract was extended in 1994 for 2 additional years to assist project completion. The study received funding from the environmental partners of Bartow, Cherokee and Cobb Counties, as well as from the City of Cartersville and the Georgia EPD.

A consolidated draft report on the Lake Allatoona Clean Lakes Study was completed in February 1998 (Burruss, 1998). The final report will be completed after a series of public participation meetings are held in April and May 1998, from which comments will be entered into the final report package. Submission of the final completed report is expected in June.

The Clean Lakes Study data for Lake Allatoona documented that the lake is in transition between mesotrophic and eutrophic. Study data indicates that Lake Allatoona is a seriously threatened lake in general, with a few major trouble areas. The Little River arm of the lake is most seriously impacted, followed by Allatoona Creek. The Etowah River is the main contributor of nutrients to the lake, not in terms of high concentration, but rather, because of its volume of flow. Nutrient levels in the lake are elevated, and bacteria levels were elevated at some sites on some visits. The water quality of Lake Allatoona has steadily declined over the past few years. Nonpoint source runoff which includes sediment, nutrients and bacteria, from new and existing development in the drainage basin, is a primary reason for this decline.

Identified Gaps and Needs

The Clean Lakes Study will provide information on nutrient concentrations and sources.

Strategies for Action

Additional point and nonpoint source controls such as agricultural best management practices may be implemented in the watersheds surrounding Lake Allatoona to minimize nutrient inputs into the lake and comply with future water quality standards.

The draft Clean Lakes study (Burruss, 1998) provides 26 action recommendations, which are grouped into nine categories:

1. Watershed Management and Protection, including identification of management goals and formation of a watershed management plan.
2. Nonpoint Source Pollution Prevention Using Best Management Practices (BMPs) to mitigate existing problems and avoid future pollution problems.
3. In-Lake Restoration, using food-web and water level manipulation to help control algal growth.
4. Septic Tank and Point Source Controls and Management, primarily directed towards control of phosphorus loads.
5. Solid Waste Strategies to address loading from existing and potential sanitary waste landfills.
6. Natural Area Preservation, including construction standards, tree preservation, and use of green space and natural buffers.
7. Water Conservation Programs to help control volume of wastewater discharges through reduced water usage.
8. Continued Lake and Watershed Monitoring to periodically assess changes in limnological indicators.

9. Public Participation Program to facilitate public participation, foster volunteer efforts, and provide a basis for local government actions to protect the resource.

Coosa River below Rome and Chattooga River Basin (HUC 03150105)

Problem Statement

The water use classifications of fishing, drinking water, and recreation are potentially threatened in Lake Weiss in Alabama due to inputs of nutrients which may cause excess algal growth in the lake. Nutrient sources include water pollution control plant discharges and nonpoint sources from urban and agricultural areas.

General Goals

Meet water quality standards and maintain nutrient loading at levels sufficient to support designated uses within Lake Weiss.

Ongoing Efforts

Alabama DEM is conducting a Clean Lakes Phase I Diagnostic/Feasibility Study the results of which will be used to develop specific lake water quality targets for Lake Weiss.

Identified Gaps and Needs

The Clean Lake Study will provide information on nutrient concentrations and sources.

Strategies for Action

Additional point and nonpoint source controls such as agricultural best management practices may be implemented in the watersheds surrounding Lake Weiss to minimize nutrient inputs into the lake and comply with future water quality standards.

7.3.6 Low Dissolved Oxygen

Etowah River Basin (HUC 03150104)

Problem Statement

The fishing water use classification was not fully supported in the Etowah River between Lake Allatoona and Richland Creek due to dissolved oxygen concentrations less than standards.

General Goals

Meet water quality standards to support designated water uses.

Strategies for Action

Low dissolved oxygen in the river segment was due to discharges of oxygen-depleted bottom water from Lake Allatoona Dam. The Corps of Engineers will work on the assessment and implementation of feasible actions to maintain acceptable dissolved oxygen concentrations in waters released from the dam.

Key Participants and Roles

- EPD: monitor and assess user support in the listed waters.
- The Corps of Engineers: owns and operates the dam.

Specific Management Objectives

Maintain dissolved oxygen concentrations in the Etowah River adequate to support aquatic life and meet water quality standards.

Management Option Evaluation

The Corps of Engineers will evaluate alternatives for improving the dissolved oxygen concentrations in the releases form the Lake Allatoona Dam.

Action Plan

- The EPD will monitor and assess use support in the listed waters and will work with the Corps to evaluate cost-effective changes in the dam operation to improve dissolved oxygen concentration the releases from Lake Allatoona Dam.
- The Corps of Engineers will evaluate alternatives in the dam operations to improve the dissolved oxygen concentrations in the releases from Lake Allatoona Dam.

Methods for Tracking Performance

A reevaluation of the status of the listed waterbodies will be made coincident with the next iteration of the RBMP management cycle for the Coosa River basin in 2002.

7.3.7 Thermal Regime in Trout Streams

Problem Statement

Development that results in increased impervious surface area, impoundments on streams, and loss of riparian canopy within the Conasauga, Coosawattee, Oostanaula, Etowah and Coosa basins are adversely affecting trout stream thermal regimes.

General Goals

To meet or exceed local, state and federal laws, rules and regulations, and be consistent with other applicable plans; and to provide for education of the general public on matters involving the environment and ecological concerns specific to each river basin.

Ongoing Efforts

A strategy and regulations are in place for controlling the construction of new impoundments on trout streams. The Rules and Regulations for Water Quality Control, 391-3-6-.03(14)(a) state "No person shall construct an impoundment on Primary Trout Waters, except on streams with drainage basins less than 50 acres upstream of the impoundment. Impoundments on streams with drainage basins less than 50 acres must be approved by the Division. No person shall construct an impoundment on Secondary Trout Waters without the approval of the Division." Applications for such impoundments are reviewed by WRD, which makes recommendations for approval or denial to EPD.

The Georgia Forestry Commission (GFC) is in the process of updating their BMP manual with modification of the guidelines for timber harvest within riparian buffers. These guideline revisions will result in more canopy remaining over streams after timber harvest.

The Georgia Soil and Water Conservation Commission (GSWCC) with its agricultural partners have produced and distributed three pamphlets; *"Guidelines for Streambank Restoration", "A Guide to Controlling Erosion with Vegetation"*, and *"Agricultural Best*

Management Practices". These publications provide recommendations for establishing and maintaining riparian buffer zones, including woody vegetation that shades streams.

The Erosion and Sediment Control (ES&C) Act affords protection to riparian stream buffers on trout streams throughout the state by providing for a 100 foot stream buffer. Under this Act, only the Director of EPD has the authority to issue variances for land disturbing activities within the riparian buffers of trout streams.

Identified Gaps and Needs

The control of increases in impervious surface area, which can lead to harmful increases in temperature in trout streams, is the responsibility of local jurisdictions, which often lack the expertise to evaluate thermal impacts of development.

Exemptions under the ES&C Act still allow for overhead canopy removal along trout streams. The new GFC BMPs address one of these exemptions and should significantly enhance canopy protection once implemented. Individual landowners need to be educated on the function and importance of riparian buffers and forested canopies along trout streams.

Strategies for Action

The protection of trout stream thermal regimes necessitates consideration of what happens on the land adjacent to the streams as well as in the streams themselves. Commercial, residential, agricultural, and silvicultural uses of the land without consideration of their effects all can lead to degraded thermal conditions for trout.

Partners will enhance forested riparian canopy protection along trout streams through a three point approach: 1) voluntary BMP compliance within the forestry and agriculture community, 2) enforcement of the Erosion and Sediment Control Act and the riparian buffer variance process, and 3) consideration of thermal impacts when approving new impoundments.

Key Participants and Roles

- EPD, GSWCC, NRCS, WRD, GFC, and local land disturbing activity permit issuing authorities will address riparian cover protection.
- EPD and WRD will address permitting of impoundments on trout streams.
- Local planning authorities, with assistance from WRD and EPD, will address thermal impacts of increased impervious surface cover.

Specific Management Objectives

Ensure appropriate thermal regime in Primary and Secondary Trout Streams.

Action Plan

- EPD and WRD will continue to enforce regulations governing approval and construction of impoundments on trout streams.
- EPD will continue to enforce the E&SC Act's riparian buffer requirements and conduct a variance review process with emphasis on protecting forested riparian canopies and on addressing thermal loading due to increased impervious surface area.
- EPD, NRCS, GSWCC and local issuing authorities will assure compliance with the Erosion and Sediment Control Act.

- Local planning and zoning authorities should address potential thermal impacts of increased impervious cover in developments.
- GSWCC and NRCS will work within the agriculture community to increase BMP compliance for riparian buffers.
- GFC will work with the silviculture community to implement the new BMPs designed to protect forested riparian canopies.

Methods for Tracking Performance

GSWCC, NRCS, and GFC will track BMP compliance during this river basin cycle. WRD and EPD will assess status of trout streams.

7.3.8 Protection of Threatened and Endangered Species

Problem Statement

The Coosa basin is home to a number of aquatic species which have been listed as threatened or endangered and require protection.

General Goals

To provide aquatic habitat and management to support the survival and propagation of threatened and endangered species; to meet or exceed state and federal laws, rules, and regulations for the protection of endangered species; and to incorporate planning for protection of threatened and endangered species into all aspects of basin planning.

Ongoing Efforts

Information on ongoing efforts to protect threatened and endangered species in the Coosa River basin was not available at the time of the preparation of this draft plan.

7.3.9 Water Quantity Demand

Problem Statement

Sufficient water quantity to meet the competing demands for drinking water, minimum instream flow rate and other environmental releases, hydropower, and recreation uses may not be available within the area of Lake Allatoona (HUC 03150104), Carters Lake (HUC 03150102), and the other portions of the Coosa River basin. There is concern over meeting future needs in the Dalton area (HUC 03150101). There is also concern about sufficient quantity of water below Rome (HUC 03150105) to assure water quality in the Coosa River and in Lake Weiss.

General Goals

Provide adequate downstream water releases to meet Georgia's priority needs while maintaining pool levels in Allatoona and Carters Lake which provide for recreation opportunities and hydropower production, yet which anticipate potential future water shortages as the highest priority.

Ongoing Efforts

Water quantity needs and allocations throughout the entire basin are being addressed through the ACT/ACF Study. The ACT Compact has been approved and Compact Commission meetings began in February of 1998. The Commission is charged with the

responsibility of developing an allocation formula for the basin by December 31, 1998 which will be acceptable to the states of Alabama and Georgia, as well as the Federal Government. Projections of future water needs indicate that not all demands can be met under historic conditions of water shortages without modification of the operation of Lake Allatoona and Carters Lake. It may also be necessary to increase the allocation of storage in these reservoirs for drinking water purposes. In addition, there is concern that projections of future water needs in northwest Georgia, particularly in the Dalton area, reflect an under-prediction in the growth of population and the carpet industry.

Identified Gaps and Needs

The models and databases which have been under development for the Comprehensive Study since 1991 must be completed and approved prior to development of an allocation formula. Negotiations will take place during 1998 to reach an agreement on water allocation out to the year 2050.

Aquatic habitat can be adversely affected by unnatural variations in lake levels and river flow. One significant issue which is receiving attention is that of the minimum stream flow rate which must be maintained below reservoirs and river water withdrawals. In September of 1996, the Directors of EPD and the Wildlife Resources Division (WRD) empaneled a multidisciplinary group of stakeholders to review EPD's existing minimum stream flow policy of protecting the lowest seven-day average flow which occurs with a frequency of one in a ten-year period (7Q10 flow). In November of 1997 this group submitted a set of recommendations, which concluded that there was sufficient cause to modify the current policy to better protect stream biological diversity and aquatic habitats, but that there was not a sufficient number of site-specific studies in Georgia on which to base a definitive long-term modification to the current policy. The group recommended that interim modifications to the current policy be employed until such time as sufficient data are available to establish a scientifically defensible long-term policy.

Strategies for Action

Water quantity will be managed in the context of the ACT/ACF allocation process which is expected to address such issues as reservoir operation and storage volume reallocation, as well as defining the portion of Coosa basin flows which will be available for Georgia's use. If successful, the allocation is expected to be effective by the latter half of 1999. Georgia will be responsible for delivery of certain flows to Alabama under specified conditions, but neither the Compact nor the Commission will interfere with Georgia's internal decision making process or affect allocations of water within Georgia. Georgia will not agree to an allocation for the ACT basin which falls significantly short of its expected needs in a drought, though there may be less than optimal quantities of water for some uses in times of shortage.

Key Participants and Roles

- The ACT Compact Commission is responsible for developing the water allocation formula. The Commission consists of two voting members, who are the governors of the states of Georgia and Alabama, and one nonvoting Federal Commissioner, Mr. Lindsay Thomas, who was appointed by the President. In addition, each Commissioner has the right to appoint alternate commissioners to act is his or her place when unable to attend.
- States of Georgia and Alabama are parties to the ACT allocation process.

- The U.S. Army Corps of Engineers has the primary operational control of flow of water within the basin.
- Stakeholders representing the various public, private, and business interests in water use and conservation within the states of Alabama and Georgia are actively involved in providing input to the states and federal government about the best ways to manage water resources in the ACT basin.
- The federal government, with the U.S. Army Corps of Engineers as lead agency, is preparing an Environmental Impact Statement to evaluate the impacts of the chosen allocation formula and management procedures.
- EPD and WRD are responsible for establishing minimum instream flow requirements below permitted withdrawals.

Specific Management Objectives

Develop an allocation of water resources in the ACT basin, including the Coosa River basin, which will satisfy the projected needs of Alabama and Georgia, as well as the federal government, through the year 2050.

Management Option Evaluation

A formal evaluation of management options will take place as part of the ACT Basin allocation process. Planning for the Coosa River basin must be consistent with the ACT allocation. However, detailed Coosa basin management activities will not be determined by the interstate agreement as local control of water resource decisions will be retained.

Action Plan

- Complete ACT allocation formula by December 31, 1998.
- Federal concurrence (or non concurrence) within 255 days of the allocation formula.
- Following concurrence with the ACT allocation formula, EPD will work with county and municipal governments and with other stakeholders to develop an action plan that is consistent with the formula.
- EPD and WRD will develop a final long-term policy for minimum instream flow requirements.

Method for Tracking Performance

To be determined.

7.3.10 Source Water Protection for Drinking Water Sources

Problem Statement

Many public water supplies have no control over their source watersheds and have to spend additional treatment dollars to insure a high quality water supply. All streams with municipal water intakes need to have watershed assessments and protection plans developed, and implemented.

General Goals

EPD will establish proactive planning and management to maintain safety and high quality of drinking water sources on all streams with municipal water intakes by having

watershed assessments and protection plans developed and implemented. All streams and existing lakes under serious consideration for use as public water supplies will have a source water assessment made early in the planning process.

Ongoing Efforts

Georgia EPD is developing a Source Water Assessment Program (SWAP) in alignment with EPA's initiatives. EPD is working with USGS on some program elements and beginning to work with some water authorities in starting the process. Some water authorities and local governments have adopted source water protection measures in conjunction with Growth Strategies Initiatives. Other local groups (e.g, The Conasauga Alliance) have taken an interest in promoting source water protection in the basin.

Identified Gaps and Needs

This is a new and more comprehensive initiative and neither EPD nor many local authorities have much experience in performing the assessments and the protection plans. The Implementation Plan is still under development by EPD.

There are complexities in developing an assessment that would be general to all watersheds because of the varying land uses. Therefore, EPD has the task of deriving a number of approaches that can be applied to a watershed depending upon the development and land uses within it. EPD must derive these approaches with the assistance of advisory committees and the public prior to submitting the SWAP Implementation Plan to EPD.

EPD must also find effective measures to promote and encourage local communities to adopt source water protection programs using the assessment results.

Strategies for Action

EPD will develop and submit to the Environmental Protection Agency a SWAP Implementation Plan by February 6, 1999. EPD will describe in the SWAP Implementation Plan methods and approaches for (1) delineating the source water protection areas for all public water supply sources within the State (the outer management zone for ground water sources); (2) inventorying potential contaminants within the delineated protection zone; (3) determining water supply susceptibility to significant potential contaminants within the protection zone; and (4) involving the public in developing SWAPs and make assessments available to the public.

Key Participants and Roles

EPD, local governments, water authorities, federal, state, local agencies, and special interest groups.

Specific Management Objectives

The EPD is actively working toward the national goal of by the year 2005, 60 percent of the population served by community water systems will receive their water from systems with source water protection programs (SWPP) in place under both wellhead protection and watershed protection programs". EPD intends to accomplish this goal by developing and implementing a source water assessment program (SWAP) in alignment with EPA's initiatives.

Management Option Evaluation

Formulation will be on a site by site basis and be updated with each planning cycle in the basin.

Action Plan

- EPD will submit a SWAP Implementation Plan by February 6, 1999.
- Identify water intakes and authorities.
- Delineate watersheds contributing to intakes.
- Establish criteria and guidelines for assessments and protection plans.
- Provide support to water authorities and local governments.
- Review and approve source water protection plans.

Methods for Tracking Performance

To be determined.

7.3.II Flooding and Floodplain Management

Problem Statement

Flooding in the Rome area (HUCs 03150103, 03150104, and 03150105) continues to be a major factor associated with property loss in the basin.

General Goals

Increase awareness and knowledge of floodplain management. Enhance the floodplain management capabilities of communities participating in the National Flood Insurance Program (NFIP).

Ongoing Efforts

The EPD will continue to provide workshops, technical assistance, and data to participating communities and other parties involved in floodplain determinations.

Identified Gaps and Needs

Communities participating in the National Flood Insurance Program need to become more aware of the necessity for implementing more stringent floodplain management measures and developing multi-objective management strategies to address issues related to flooding.

Strategies for Action

Develop “action partnerships” with agencies and organizations such as Regional Development Centers (RDCs), Georgia Municipal Associating, and Association of County Commissioners of Georgia to maintain compliance and increase the number of NFIP communities within the basin. Agencies such as the Natural Resources Conservation Service and U.S. Army Corps of Engineers are potential resources for technical data and information.

Key Participants and Roles

- Federal government (FEMA): Identify and map communities flood hazard areas; provide technical assistance to communities; establish insurance rates based on identified risk.
- State government (Floodplain Management Office): Provide guidance and technical assistance to participating communities; evaluate and document communities and state agencies floodplain management capabilities; provide information and training to the private sector.
- Local governments: Administer and enforce local floodplain management regulations in compliance with federal standards; issue or deny development/building permits; notify property owners of flood risk; maintain community flood maps for public inspection; apply for participation in the National Flood Insurance Program.

Specific Management Objectives

- Increase the public and private sectors awareness and understanding of floodplain management.
- Enhance the effectiveness of floodplain management at the state and local level.
- Maintain compliance of participating communities; increase the number of local communities participating in the NFIP.

Action Plan

- The following activities will be implemented by the Georgia Floodplain Management Office:
- Expand the use of information technology to improve the level of awareness regarding floodplain management.
- Continue to establish public and private partnerships to promote understanding of floodplain management.
- Increase opportunities for delivery of floodplain management training and technical workshops.
- Identify target communities for participation in the National Flood Insurance Program (NFIP).
- Identify target communities with the possible capabilities of enacting stronger measures to further reduce flood damages.

Method for Tracking Performance

Participation rates in NFIP; flood damage assessments.

References

Burruss. 1998. Lake Allatoona Phase I Diagnostic-Feasibility Study, Report for 1992-1997 (Draft). Prepared for U.S. EPA, Georgia EPD, Bartow County Government, Cherokee County Water Authority, City of Cartersville, Cobb County Government, and Cobb-Marietta Water Authority. A.L. Burruss Institute of Public Service, Kennesaw State University, Kennesaw, Georgia

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